# COMPTON'S PICTURED ENCYCLOPEDIA



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Hilda Hawkey

IN CHILDHOOD all the World is new. The gates of the mind are swung open, and in the gateway stands a smiling serving man whose name is Curiosity. He beckons every passing fact and fancy and bids them in to the feast where sits that noble lord—Imagination. Here every fact is clothed in vivid colors; every fancy roams free.

Then it is that ideas and ideals are formed. But when Curiosity calls, there must be someone to usher in the guests, or perchance Truth and Falsehood will sit down together at the feast. There must be someone to guide, or Confusion and Disorder will preside at Imagination's table.

The Mother, the Father, the School—these are the ushers in the Romantic Adventure of Learning, and their best assistants are good books. As guide, let them take this volume, for such is the service to which it is dedicated.

# WHEN ALL THE WORLD IS NEW



*The Romantic Adventure of Learning*

# COMPTON'S PICTURED ENCYCLOPEDIA

VOLUME 8

*To inspire ambition, to stimulate the imagination, to provide the inquiring mind with accurate information told in an interesting style, and thus lead into broader fields of knowledge—such is the purpose of this work*




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# TABLE OF CONTENTS of Volume Eight

## STUDY OUTLINES AND OTHER FEATURES


MAKING THE MOST OF COMPTON'S . . . . . 3843

NATURE STUDY . . . . . 3846

GEOGRAPHY . . . . . 3861
- Physical Geography . . . . . 3861
- Races of Mankind . . . . . 3866
- North America . . . . . 3869
  - United States . . . . . 3877
  - Canada . . . . . 3889
  - Mexico . . . . . 3891
- Central America and the West Indies . . . . . 3893
- South America . . . . . 3895
  - Countries of South America . . . . . 3897
- Europe . . . . . 3899
  - Great Britain and Ireland . . . . . 3901
  - France . . . . . 3902
  - Belgium and Switzerland . . . . . 3903
  - The Netherlands . . . . . 3904
  - Germany . . . . . 3905
  - Denmark, Sweden, and Norway . . . . . 3906
  - Finland, Esthonia, Latvia, and Lithuania . . . . . 3907
  - Poland . . . . . 3908
  - Austria, Czecho-Slovakia, Hungary, Rumania . . . . . 3909
  - Spain and Portugal . . . . . 3910
  - Italy . . . . . 3911
  - Jugo-Slavia, Bulgaria, Albania, and Greece . . . . . 3912
  - Russia . . . . . 3913
- Africa . . . . . 3914
  - Divisions of Africa . . . . . 3916
- Asia . . . . . 3919
  - Asiatic Russia and Allied Territory . . . . . 3921
  - Japan and China . . . . . 3922
  - Indo-China and Malay Peninsula . . . . . 3923
  - India, Persia, and Afghanistan . . . . . 3924
  - Divisions of Southwestern Asia . . . . . 3925
  - East Indies . . . . . 3926
- Australia, New Zealand, and Pacific Islands . . . . . 3927
- Polar Regions . . . . . 3928

BIOLOGY . . . . . 3935
- Botany . . . . . 3937
- Zoölogy . . . . . 3944

HISTORY . . . . . 3953
- Ancient History . . . . . 3953
  - The Dawn of Civilization . . . . . 3953
  - The Greeks . . . . . 3955
  - Rise and Fall of the Roman Empire . . . . . 3956
- Medieval History . . . . . 3957

# Table of Contents of Volume 8


Modern History . . . . . 3960
Renaissance and Reformation . . . . . 3960
Period of Civil Strife . . . . . 3961
Struggle for Power and Possessions . . . . . 3962
Rise of Prussia and Russia . . . . . 3963
French Revolution and Napoleon . . . . . 3963
Industrial Revolution . . . . . 3964
Europe in the 19th Century . . . . . 3965
Awakening of the Far East . . . . . 3966
Europe Before the World War . . . . . 3967
World War and Its Consequences . . . . . 3967
United States History . . . . . 3969
Canadian History . . . . . 3975

MYTHOLOGY . . . . . 3981
Greek and Roman Mythology . . . . . 3981
Norse and Teutonic Mythology . . . . . 3984

SOCIAL SCIENCES . . . . . 3987
Sociology . . . . . 3987
Economics . . . . . 3989
Political Science (Civics) . . . . . 3990
Education . . . . . 3993

HOME ECONOMICS . . . . . 3995

PICTURE STORY OF DRESS . . . . . 3997

PICTURE STORY OF HOUSES . . . . . 3998

PICTURE STORY OF TRANSPORTATION . . . . . 3998

PHYSIOLOGY, HYGIENE, AND MEDICINE . . . . . 3998

LANGUAGE AND LITERATURE . . . . . 4001

FINE ARTS . . . . . 4004
Architecture . . . . . 4004
Sculpture . . . . . 4006
Painting . . . . . 4008
Music . . . . . 4010

AGRICULTURE . . . . . 4015

INDUSTRIES AND APPLIED SCIENCE . . . . . 4019

BOOKS THAT TELL HOW TO DO THINGS . . . . . 4024

THE HOW AND WHY OF THINGS . . . . . 4025

PHYSICAL SCIENCES . . . . . 4027
Physics . . . . . 4027
Chemistry . . . . . 4038
Astronomy . . . . . 4045

MODERN EDUCATION AND THE PROBLEM-PROJECT . . . . . 4048
Problem Method in Geography . . . . . 4058
Problem Method in English . . . . . 4062
Project Method in History . . . . . 4066

**THE FACT-INDEX** . . . . . 4069

# MAKING *the* MOST *of* COMPTON'S PICTURED ENCYCLOPEDIA



A Library of Good Reading

AN ENCYCLOPEDIA prepared, as this one has been, with a new vision and a new purpose is capable of serving in many widely different and many unexpected ways. The extent of this service does not, however, depend solely upon the quality and scope of the work accomplished by the editors and publishers. It depends also upon you—upon the intelligence with which you use the instruments that have been placed in your hands. It will be profitable therefore to examine briefly the nature of these instruments, and to determine how they may be made to yield the maximum service.

The main text and the illustrations need little explanation. The articles are arranged, of course, in alphabetical order, and the alphabetical guide words are printed in the top corners of each page. The longest and most important articles begin in nearly every case with special headings extending across both columns. These headings are designed to catch the eye and to set forth at a glance the spirit and significance of the subject. The illustrations will always be found directly associated with the articles they illustrate. Too much emphasis cannot be placed upon the importance of reading closely the text which accompanies and explains the pictures. This text, with a few necessary exceptions, *does not repeat* information already given in the article, but consists of *additional information* of the utmost value.



A Key to Systematic Study

The chief distinguishing feature of Compton's Pictured Encyclopedia is the fact that its articles are written in a style so vivid and interesting that they may be enjoyed as you would enjoy the stories in a magazine. In keeping with the purpose to make the encyclopedia a library of "good reading" as well as a work of reference, lists of the most important articles will be found at the beginning of each volume under the title "Here and There." Make use of those lists when you pick up the volumes for casual reading; they will help you to select the "fact-story" suited to your inclination of the moment.

As you thumb through the pages of the main text, you will notice that there are comparatively few of the so-called "definition" articles, such articles as undertake in four or five lines to define subjects considered relatively unimportant. You will notice also that there are none at all of the so-called "dummy entries," in which the name of the subject appears merely to direct you to some other article where it is treated, as for instance: "ANTHROPOMETRY. *See* Anthropology." These devices, so common in the older works of reference, not only consumed an enormous amount of space, but proved unsatisfactory to the reader. The "definition" articles rarely contained an adequate amount of information, and what they did have usually had to be repeated elsewhere in connection with some larger related subject. Thus a subject like "Combustion" would be briefly defined under that name, then necessarily referred to again under "Fire." The "dummy" entries, on the other hand, contributed absolutely no information and resulted in annoyance and loss of time to the student or reader.



An Inexhaustible Mine of Facts

## The Value of Combined Information

Compton's Pictured Encyclopedia abandoned at the outset this ancient system. The result has been twofold: first, so much space was saved by doing away with duplication that the editors were able to include vastly more information in the compass of the work than would appear possible, judging by former standards; second, and even more important, the minor subjects were put *where they belong*—that is, they were incorporated in those larger subjects of which they form a part, and which provide the background necessary to bring out their meaning and relative importance. Thus, no separate article is devoted to the process of "Osmosis." A mere abstract explanation of this term might consume more than a column, and still leave the reader somewhat in doubt as to its true meaning and importance. But in the article on "Plant Life," the process of Osmosis is not only defined and described, but its vital significance in Nature is brought out by picture and text in a manner to attract interest and make a lasting impression. In this way the "Plant Life"

article helps to make Osmosis clear and Osmosis in turn contributes to the understanding of one of the most important features of Plant Life.

The "definition" articles and "dummy entries" were essential to the old type of American encyclopedias, *because they did not have adequate indexing systems.* If a reader was to find a subject at all, the name, at least, had to be included in its alphabetical place in the text, even if the proper treatment of that subject was given elsewhere. Obviously, no encyclopedia, no matter how large, can list in its main text all the subjects and names which a reader might seek. You would, for instance, look in vain through most encyclopedias, even the largest, for an entry on "Mary Ball," and unless the encyclopedia carried an index you might never find out that this was the maiden name of George Washington's mother. Latin names of plants and animals are constantly occurring in scientific texts without their English equivalents, yet many of the very commonest ones, such as *Musca domestica* (the housefly) could not be found in the largest encyclopedias without an index.



A Universal Picture Gallery

## The Value of the Fact-Index

The editors of Compton's Pictured Encyclopedia saw from the outset that an adequate index would not only permit them to save space and gain interest and emphasis by a suitable combination of related subjects into longer articles, but also that it would make readily accessible to the reader every detail of information in the whole work, whether in the text or in the pictures. By close study and tests they determined that casual references could in the long run be found much more quickly by using an index than by searching through the text. They went further than this—they decided to give the index somewhat the character of a dictionary in which would be provided brief definitions of unusual words and their pronunciation, short biographical summaries, condensed geographical information, résumés of the chief events in the history of important countries, and countless other informative details—all in the interest of saving time and trouble.

The result is the Fact-Index at the end of the encyclopedia. This marks an important step forward in the preparation of reference works. No enterprise of such scope, of such variety of usefulness, of such completeness has ever before been carried out in connection with an encyclopedia. With its aid you are able to extract the full value from every word of the text.

The moral of this lesson is obvious: ALWAYS USE THE FACT-INDEX WHEN YOU ARE LOOKING FOR A DEFINITE REFERENCE. If you want to know quickly what are the native races of Africa, do not read through the whole article on Africa, but turn to "Africa" in the Fact-Index, and there you will find the subdivision "native races," with page numbers telling you exactly where the information is to be found. Even if you are interested in Africa as a whole it is better to go to the Fact-Index, for it will give you many page references to information in other articles *outside* of the Africa article. By this means, if you wish, you can read all there is about Africa in the whole encyclopedia.

Become familiar with the technical details of the Fact-Index, with the simple abbreviations used in it, with the system of subdividing the larger entries for the reader's convenience. All of it is very clear and easily understood, and the more you use it, the more it will yield you. Once you form the "index habit," you will be surprised how easily you can run down information. It is an old and true saying that "half of all education lies in knowing *how to use* good books."



A Guide to the Best Books

## The Use of the Study Outlines

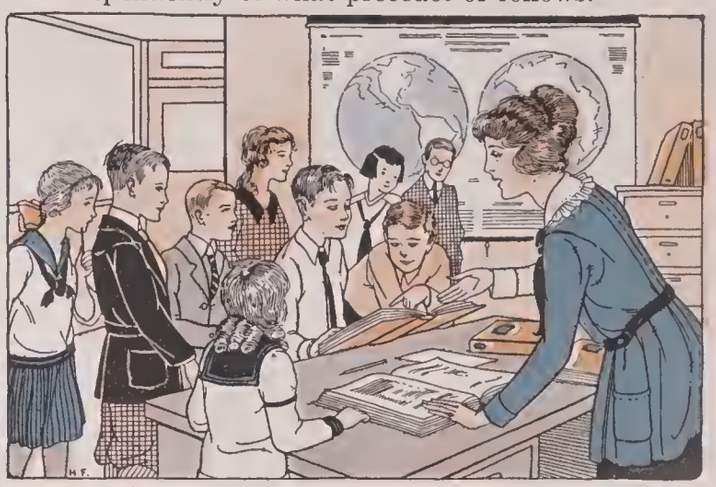
We have seen that the Fact-Index is the best instrument for bringing out *details* of information. It splits up the text and lists each item, large or small, by itself where you can readily find it. The Study Outlines do exactly the opposite. They gather up all the information in the encyclopedia into great groups—the groups which form the main divisions of human knowledge. There this information is listed and arranged in logical order, in the order which seems best adapted for developing a sound knowledge of the whole subject. The Geography Outline, for instance, brings together into a single consecutive chain all the material of Geography contained in Compton's Pictured Encyclopedia, fitting each part into the other, link by link, until the whole of Geography has been surveyed.

These Outlines, however, are much more than mere "guides to reading," much more than mere titles of articles or of portions of articles arranged in table form. A glance through them will show you that their subdivisions consist for the most part of sentences or phrases, of brief notes and explanations, which serve to bring out the significance of each step and its relations to what precedes and what follows. In other words, they are skilled teachers in print. It would be profitable, indeed, merely to read through many of these

# Making the Most of Compton's

Outlines, even if you did not look up a single page reference, for this would give you a rapid and quite intelligible survey of the subject in question. On the other hand, they are so arranged that those interested in only a single section of a big field of study may use that section independently of what precedes or follows.

The Outlines may be used for independent home study by boys and girls or by adults; they may be used as guides in collateral reading or review work in connection with school courses; or they may be used by teachers to supplement and fill out their classroom outlines. As far as possible, they have been prepared along the lines of the most widely approved modern school methods, which seek to develop the practical significance and application of the various branches of learning. In connection with "problem-project" work, they will prove particularly valuable.



A Valuable Assistant in the Classroom

Attached to each of the Outlines will be found lists of books for supplementary reading. These bibliographies are graded, as far as the subject permits, according to the age of the readers. The divisions marked "High School and After" contain for the most part books which are equally suitable for adult reading. The lists entitled "Picture Aids" contain the most important pictures to be found in the encyclopedia on each subject. The departments called "Interest-Questions" are intended to serve as stimulants to lead into the pages of the text, and are not in any sense meant to be examination questions. Parents will find that these questions, as well as the pictures, will arouse the interest of children who otherwise might be disinclined to reading of any sort.

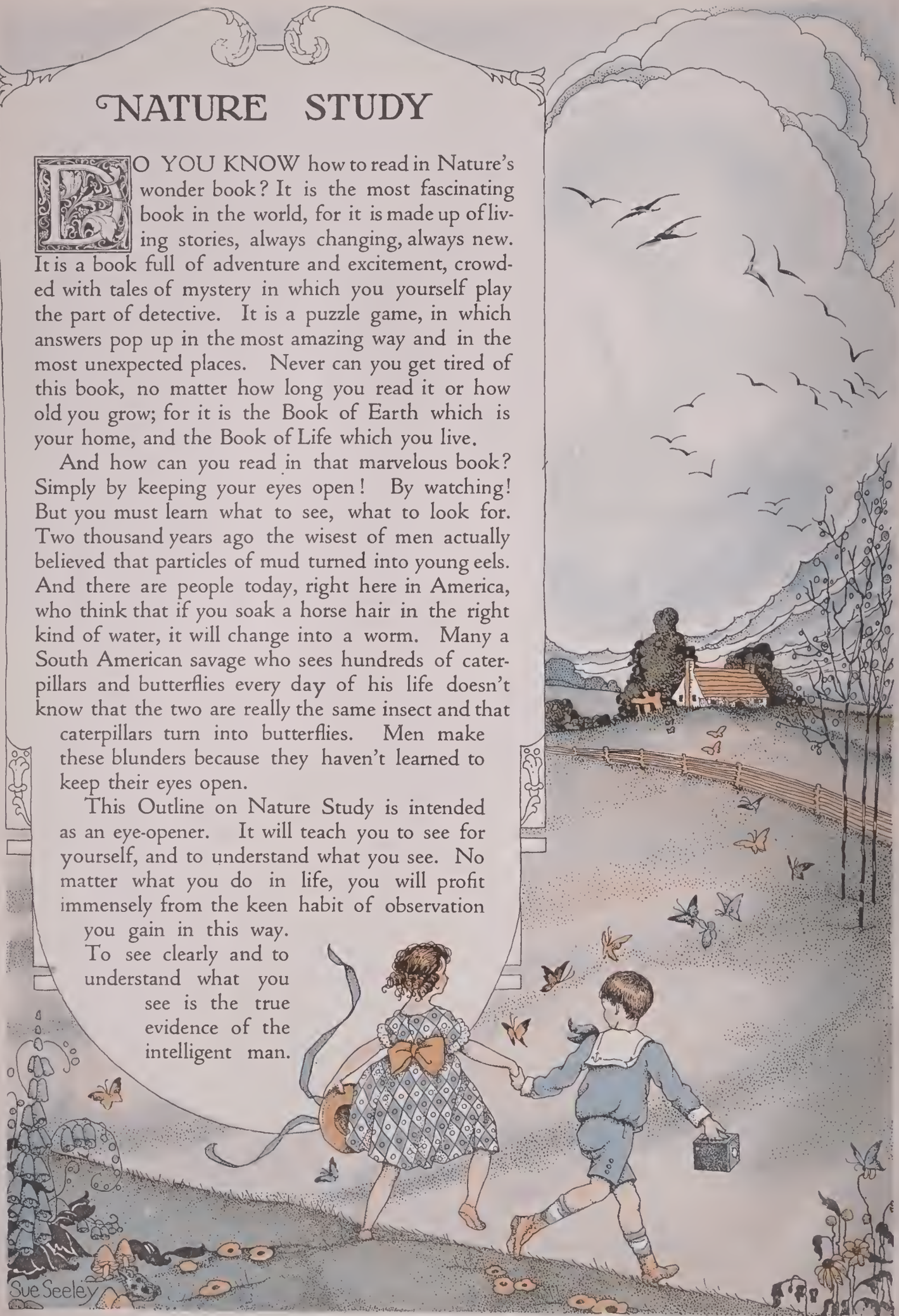
In closing, let us emphasize again the importance of becoming familiar with and using all of these instruments we have described. Each one of them was carefully designed for its purpose, each one of them serves to round out some important feature in "The Great Adventure of Learning." Call them constantly to your service. For every investment of time and energy you make in this way, you will be repaid tenfold.

# NATURE STUDY

DO YOU KNOW how to read in Nature's wonder book? It is the most fascinating book in the world, for it is made up of living stories, always changing, always new. It is a book full of adventure and excitement, crowded with tales of mystery in which you yourself play the part of detective. It is a puzzle game, in which answers pop up in the most amazing way and in the most unexpected places. Never can you get tired of this book, no matter how long you read it or how old you grow; for it is the Book of Earth which is your home, and the Book of Life which you live.

And how can you read in that marvelous book? Simply by keeping your eyes open! By watching! But you must learn what to see, what to look for. Two thousand years ago the wisest of men actually believed that particles of mud turned into young eels. And there are people today, right here in America, who think that if you soak a horse hair in the right kind of water, it will change into a worm. Many a South American savage who sees hundreds of caterpillars and butterflies every day of his life doesn't know that the two are really the same insect and that caterpillars turn into butterflies. Men make these blunders because they haven't learned to keep their eyes open.

This Outline on Nature Study is intended as an eye-opener. It will teach you to see for yourself, and to understand what you see. No matter what you do in life, you will profit immensely from the keen habit of observation you gain in this way. To see clearly and to understand what you see is the true evidence of the intelligent man.



# NATURE STUDY

## Preliminary Reading for Little Children

FOR little children, not yet old enough to begin Nature Study in a systematic way, the story method is the best introduction to the subject. Interested at first in the adventures of their animal heroes, they soon develop a desire to find out more about the animals themselves and the natural surroundings in which the animals live. The following stories, selected from the "Story Hour Tales" to be found in these volumes, will prove admirably suited to this purpose. While retaining the full imaginative flavor that appeals so directly to the child, they serve at the same time to bring out the principal characteristics and habits of the animals in question.

### TALES THE WOODMAN TOLD

The Story of Johnny Bear: **351.**
The Story of Fleetfoot, the Deer: **982.**
Mogul, the Baby Elephant: **1128.**
The Story of the Lynx with Wings: **2088.**
Adventures of Howler, the Monkey: **2293.**
How the Mouse Grew So Small: **2360.**
How Mr. Rabbit Lost His Tail: **1586.**
Mr. Coon Who Wouldn't Change His Mind: **2952.**
Why the Tortoise Bites So Hard: **3564.**
How the Whale Learned to Smoke: **3727.**

### OTHER ANIMAL STORIES

What the Crawfishes Had to Say for Themselves: **916.**
The True Story of Jimmy, a Tame Crow: **927.**
Greyfriars Bobby—The Story of a Dog: **1024.**
Mr. Earthworm Tells His Own Story: **1067.**
The Pigeon That Won a War Medal: **2806.**
Mr. Fluffy Tail and Miss Curly Locks: **3335.**

## General Outline for Older Students

The following articles will provide the foundation for practical Nature Study. They will serve to outline its purpose and to suggest in a broad way the divisions of the subject and the kind of facts and problems with which the nature student deals. The articles in Sections II and III should at this time be read merely for their general interest value, the more technical portions to be passed over lightly. These articles will be reviewed more carefully in the later divisions on Botany and Zoölogy.

I. NATURE STUDY: **2407.**
- A. A Wild Garden and Its Tenants: **2416.**

II. PLANT LIFE: **2820.**
- A. Lower Types of Plants: Bacteria 302; Algae 90; Fungi 1382; Lichens 1994; Moss 2338; Liverworts 2032; Ferns 1232.
- B. Flowers: **1304.**
  - a. The Life of a Flower: 1305.
- C. Trees: **3530.**
  - a. A Year in the Forest: 3534.
- D. Weeds: **3712;** showing weeds as the "fighters" of the plant world.
- E. Water-Plants: **3700.**

III. ANIMAL KINGDOM: **127.**
- A. Amazing Instances of Animal Behavior: **130.**
- B. Introduction to Some of the Commoner Animals:
  - a. Lower Types: Amoeba 118; Worms 3813; Snails and Slugs 3255.
  - b. Insects: **1781.**
    1. Some Mysteries of Insect Life: 1789.
    2. Ant 139; Bee 359; Beetles 366; Butterflies and Moths 544; Caterpillars 660; Fly 1312; Grasshopper 1503; Wasps 3690; Water-Bugs 3696.
  - c. Spiders: **3320.**
  - d. Fish: **1271.**
    1. Principal Food Fishes of the World: 1278.
    2. Salmon 3113; Eel 1089.
  - e. Frog: **1373;** Toad: **3506.**
  - f. Lizards: **2035;** Snakes: **3257;** Turtle: **3562.**
  - g. Birds: **400.**
    1. Leading Families Among Our Bird People: 413.
    2. Birds' Songs and Houses: 421.

**h. Mammals: 2132.**

1. Cattle 662; Horse 1682; Sheep 3198; Goat 1476; Hog 1670; Deer 979.
2. Hares and Rabbits 1583; Guinea-Pig 1548; Rat 2977; Mouse 2359; Muskrat 2384; Squirrel 3333; Chipmunk 752; Groundhog 1543; Gopher 1488; Prairie-Dog 2912; Porcupine 2883.
3. Cat 657; Dogs 1018; Fox 1336; Wolf 3774; Bear 349; Badger 303; Raccoon 2951; Skunk 3246; Mink 2251; Seal 3166.
4. Mole 2278; Hedgehog 1627.
5. Bat 345.
6. Monkey 2287.

# Nature Study the Year Around

THERE are no fixed rules for Nature Study. You may begin anywhere, at any time. You may start with the whale and work down to the tiny bacteria, or you may go the other way around. You may start with animals or you may start with plants. Indeed, you needn't begin with living things at all. If you are a boy building things with wood, you notice that some wood is hard, some soft, some heavy, some light, some fine grained, some coarse. You wonder how this happens. You start to find out, and the first thing you know you are right in the middle of Nature Study. Or, if you are a girl, you notice the difference between sewing threads and between various kinds of cloth. Here again, if you are curious about the reasons, you will become a nature student whether you know it or not.

No matter where you begin, if you ask questions about the common everyday things of life, you will find yourself very quickly following the fascinating paths through Nature's great garden-menagerie. There are two important rules to follow in finding your way through these paths. First, begin with the animals and plants that are right around you, those that you can *see for yourself;* second, among those that are around you, choose at the outset the animals and plants that you like the best, for love of Nature and sympathy with Nature are essential.

Do not try to do too much. Among the experiments suggested, pick out a few and *carry them out to the end.* If you try to keep four or five different kinds of pets, take care of a flower garden, cultivate a vegetable patch, and make several different collections, all at the same time, you will not do any one thing well and so you will become dissatisfied. Pick out not more than one or two for each season, and leave the others until next year.

## Fundamental Principles of Nature Study

**While you are at work, always bear these two great thoughts in mind:**

**A. All Nature is a unit.** Every part is connected with every other part. The plants you see around you depend on the kind of soil and climate you have; the animals depend upon the plants or upon other animals. No living thing can ever be entirely independent. Nature Study is the study of the marvelous adjustment in these fascinating relations.

**B. Everything in Nature has a reason.** The shape of every leaf, every flower, every seed, the form and color of every animal, the arrangement of their feet, their teeth, their fur, their feathers, the way every bird builds its nest, the way every creature looks after its young, every detail of structure and habit, large or small—all these things have a reason. Nature Study is the study of those reasons.

## SPRING

**GUIDING MOTIVE: Spring is the season of birth and awakening. Nature, after the Winter months of rest, is aroused to new and vigorous life.**

**PLANTS—**

**I. STUDY OF BUDS:**

**A. First Appearance:** Examine the trees of your neighborhood. See which ones bud first. Note the effect of a day of brilliant sunshine, a day of rain, a night of frost.

a. Read "A Year in the Forest—Spring" (3534) for suggestions.

**B. How the Buds Develop:** Gather twigs of Maple (2138), Elm (1138), Linden (2018), Buckeye (523), or other budding trees of the neighborhood. Put them in water at home, using a fruit jar or wide-mouthed bottle. Set them where they will get plenty of sun every day; and watch carefully the development of the buds. See how the tiny leaves were curled in the bud. Note the difference between the young leaves and the young flowers.

**Note:** All good nature students keep notebooks. Each one usually works out his own system, according to his particular interests. But one very good plan is to have two small notebooks or a larger one divided into two parts—one for "Field Notes" and the other for "Experiments." The first will cover what you *see* on your trips outdoors; the second what you *do* at home. Before starting a field trip, try to have some definite plan in mind about what you intend to find and study, and make your notes along that line. Always set down the date of the trip and where you went. Don't try to write too much, just the most striking things. In your experiment notes you should go into greater detail. If you have to make or build anything, describe how you did it. The notes on experiments which extend over several days or weeks should all be kept together, showing the progress of the experiment from date to date. Whenever you get a chance, *make a drawing of what you see or do.* Drawing is far better than writing, for once you have drawn a thing you will never forget how it looks. Never mind if your first drawings

seem crude; you'll be surprised how rapidly you improve with practice. And remember your notebooks are intended for your own benefit and pleasure, not for someone else. Never think of what others will say about them.

## II. STUDY OF FLOWERS:

A. **Spring Flowers:** Watch for the appearance of the first Spring flowers. Can you think of a reason why trees usually bud in the Spring before the smaller flowering plants spring up from the ground? Which warms up first, the air or the ground?

B. **Flower Calendar:** It is a good plan to make a "flower calendar" in your field notes, dividing it into squares like an ordinary monthly calendar and writing the name of the Spring flowers in the squares with the dates when you first saw them.

C. **Collecting Flowers:** When Spring is well under way, collect as many different wild flowers as you can find in an afternoon's trip.

a. When you get home, after carrying them in your warm hand, how do they look? How does the stem look? Do the flowers hold their heads up? What has happened to the leaves since you picked them?

b. Now put them in water and watch carefully what happens. Have you ever come in from a long walk hot, tired, and thirsty? How did the first glass of cool water make you feel? Do the flowers remind you of that?

1. Put a few of the flowers into water stained with red ink or some other bright water color. The next day cut through the stem, half-way up; examine the cut ends. What do they tell you about how flowers drink?

c. See how many of the flowers you can name. Find out, if you can, the names of all the others by asking people who are familiar with flowers. Look up the names of the ones you like best in the Fact-Index at the end of this volume, and read about them on the pages indicated there. Make sketches of one or two in your field notes.

**Note:** One of the most fascinating ways of learning about wild flowers and weeds is to make a collection of dried specimens. This is very easy to do. Whenever you find a new kind, take it home, lay it out to suit your taste between two sheets of newspaper or other coarse-grained paper, put the sheets between two boards and set heavy weights, such as four or five bricks or a bucket full of sand, on the top board. Change the paper after 12 hours and again after 24 hours, so the plants will dry quickly and not lose their natural colors. When thoroughly dry, mount them on special sheets by pasting narrow loops of paper across the stems at suitable places. The special mounting paper should be fairly heavy and about 8 by 10 inches in size; smooth sections of light-brown wrapping paper will do very well. Make two heavy cardboard covers of the same size; cut a straight line almost through each cover about three quarters of an inch from one of the long edges, break each cardboard along that line, and paste heavy paper across the break on one side to form a hinge. Now punch two holes about 6 inches apart on the narrow side of each hinge, and make corresponding holes near the left-hand edge of each sheet on which a flower has been mounted. By passing strings through these holes and tying them, you have a bound "flower book," in which new pages can be inserted whenever necessary. Write the name of each flower on the page where it is pasted, together with any other interesting information you may gather about it from time to time.

## III. THE PARTS OF A FLOWER: 1304, 474.

A. The important parts of a flower are the **Peduncle,** the **Sepals,** the **Petals,** the **Stamens** (each consisting of the **Filament** and the **Anther** which bears the **Pollen**), the **Pistil** (which consists of the **Ovary** containing the **Ovules,** the **Style,** and the **Stigma**).

a. Do not try to memorize these names as you see them printed. Take a flower and examine it, pulling it apart if necessary, and *learn to recognize* the different parts when you see them. If you learn the purposes of things in Nature, it is not so important to know their technical names. But it will be *much easier for you* to think and observe correctly, and to describe things to others clearly, if you learn some of the commoner terms of science.

b. Remember that the purpose of every flower is to develop seed. Fruit is, of course, just a special form of seed. The wonderful way in which the various parts of a flower carry out this purpose will form a part of your Summer studies of flowers.

## IV. SPROUTING SEEDS: 3171.

A. **Seed Structure:** Get a handful of dry Lima Beans (347). Examine one of them carefully. Notice the small nub on the inner edge. That is the **Germ** or **Embryo.** Peel off the tough outer hull, called the **Seed-Coat** or **Testa.** Notice how the inside of the bean is divided into two halves, which are united only at the Germ. These halves are called the **Cotyledons.**

B. **The Seed Comes to Life:** Fill a small wooden box with rich moist soil. Plant a dozen of the beans a quarter of an inch deep, covering them quite firmly and marking with a matchstick where each is planted. Keep the soil moist, but not soaking.

a. After two days, dig one of them up. What has happened to the Embryo? What has happened to the Seed-Coat? Dig another one up very carefully every other day and observe the development of the different parts, of the rootlet (called the Radicle), of the first small leaves (called Plumules), of the stem. Where are the Cotyledons now?

b. Note how long after planting the first stem appears above the ground. What part of the stem appears first? What shape is it? Remember that the root end is the anchor, and that the other side of the arch is pulling upward just as hard as it can. How soon does it manage to pull the Cotyledons and the Plumules out of the ground? What has happened to the Cotyledons all this time?

1. Bear in mind that the Cotyledons are simply storage houses for the Embryo's food. When we eat cooked beans, we are nourished by the food which was really intended to give the sprouting bean plant its first start in life.
2. Here is a simple way of testing this fact. The food stored in the Cotyledons is mostly starch. Iodine turns blue when it touches starch; the more starch there is, the deeper and darker the blue. Keeping that in mind, put a drop of weak solution of iodine on one of the Cotyledons when a bean first starts to sprout. Note the color. Now put a drop of iodine on a Cotyledon after a young bean plant has straightened up above the ground. What change do you notice, and what does it indicate?
3. An even simpler test is to remove the Cotyledons from one of the young plants a day after it appears above ground, and then compare its rate of growth with the others.

C. **Differences in Seeds:** Study the seeds of other plants. Plant seeds of Pea, Radish, Nasturtium, Millet, Corn, Pansy, Hollyhock, Sunflower, Cabbage, Tomato, or any other available variety, selecting a half-dozen as varied as possible in size and shape. Note how each behaves in sprouting. Has the size of the seed anything to do with the size of the sprout, or with the time it takes the sprout to appear? (Be sure to label with a bit of paper held in the split end of a match where each seed was planted, so you can identify the sprouts).

a. Notice that some seeds have only one Cotyledon. This is an important point in the scientific classification of plants, all the most highly developed plants and trees being grouped as either Monocotyledons (with one Cotyledon) or Dicotyledons (with two or more Cotyledons).

## V. MAKING A HOME GARDEN: 1394.

A. Consult the table on page 1397 telling "What and When to Plant in the Vegetable Garden."

B. Remember that, in addition to the kitchen value of your vegetable garden, you, as a nature student, are interested in the actual lives of those vegetables. Learn to know them all, how they sprout, what their flowers are like, and other similar details.

C. While you are taking care of the garden, learn to know the *reason* for everything you do. Why must the soil be spaded and pulverized before seeding time? What harm do weeds do? What is the effect of too much moisture and of too little moisture? What are the chief enemies of your garden, besides weeds? Many of these things are brought out by the plant studies in the outline for Summer work.

## ANIMALS—

You must connect plants and animals intimately in your thoughts about Nature. Remember that where there are no plants, there can be no permanent animal life. If all the plants in the world were to die, all the animals and the men, too, would die shortly afterwards. Plants are the original manufacturers of all food. Animals live upon this food, directly or indirectly. If some are able to exist as flesh-eaters, it is because they live upon others which eat vegetable food. It follows therefore, that the structure and habits of all animals are closely associated with the character of their plant neighbors.

## I. FAMILIAR PETS: 2755.

**Note:** Begin your study of animals with those nearest to you. If you have pets of your own, begin with them; if not, study those of your neighbors or make friends with the owner of an animal store. This section on Pets and the following section on Farm and Barnyard Animals does not go into the many fascinating details of tricks and habits. Those things you will have no trouble in working out by yourself. These studies are intended to bring out some of the most striking points in the bodily structure of these familiar animals, points which you might perhaps overlook, but which illustrate the great fundamental law of *natural fitness*. By the use of intelligence, men train themselves to be fit for special tasks. But the fitness of animals for the many different lives they lead has been trained and developed through untold ages by Nature. While most domestic animals have been greatly changed in appearance by the long breeding carried on by men for their own purposes, these animals retain most of the forms, instincts, and habits that were so useful to their wild ancestors. A study of these forms and habits, therefore, will be most useful in helping you to work out problems of wild life. You might well give a separate section of your field notes to "Pets and Other Domestic Animals."

A. **Dogs and Cats:**

a. **Examine a Dog and a Cat.** Notice their teeth. How do their front teeth differ from yours? Observe the extraordinary length of the eye-teeth or "canine" teeth, which is characteristic of the carnivorous or flesh-eating animals. Do Dogs and Cats always eat meat now? Does a Cat behave in the same way when you give it a saucer of milk and when you give it a piece of meat?

b. **Examine the claws of the Dog and Cat.** How do they differ? Which are sharper and why? Can you hear the footsteps of a Dog across a bare floor? Can you hear the footsteps of a Cat?

c. **Look closely at the eyes of the Dog and Cat.** How do they differ? Hold the Cat so it faces a bright light and watch the pupils of its eyes. Now take it where the light is very faint, and see what happens to its pupils. Remember that Cats hunt mostly in dark places at night, and that their eyes are made to see things when the light is exceedingly faint.

d. **Compare the fur of the Dog and Cat.** Which do you think would be warmer? Remember that the wild members of the Dog family usually catch their prey by running it down; while the wild members of the Cat family lie in ambush, often for hours, and spring upon their prey unawares. If you had to run far, which would you rather have on, the Dog's fur or the Cat's fur? Which would you choose, if you had to lie in ambush?

B. Other Pets:

a. **Examine the front teeth of a Rabbit, a Guinea-Pig, a Mouse or Rat.** You must be careful with the last two so as not to be bitten. How do they differ from the teeth of the Cat and Dog? Look up the article "Rodents," page 3036.

b. **Bird Pets:** Gather as many interesting notes as you can about the habits of bird pets, such as Canaries, Parrots, and Pigeons. How do birds get along without teeth? Notice the arrangement of their claws. How many toes have they? How are they arranged for grasping a perch?

**II. FARM AND BARNYARD ANIMALS: Horse 1683; Cattle 662; Sheep 3198; Hog 1670; Goat 1476; Poultry 2908.**

**Note:** If you live in the country, you will have no trouble studying these animals; if you live in a city, you should seek opportunities for observations during your field trips.

A. Cattle, Sheep, and Goats:

a. **Watch these animals when they are feeding.** See how their long tongues gather up the grass. Do they stop to chew very much? Watch them when they are lying down after feeding. What are their jaws doing? This is one of the most remarkable habits in the whole animal kingdom. Read about it in the article on "Ruminants," page 3082.

b. **Notice the feet of Cattle, Sheep, and Goats.** How many toes have they? Look again and see if you can't see two more. Remember that nearly all Mammals, except Elephants, Bears, Monkeys, Men, and a few other groups, *walk on their toes.* Some walk on one toe, like the Horse; some on two toes, like the Cow; some on four toes like the Cat and Dog. In each case, traces of the remaining toe or toes are to be found higher up on the leg. The "hock" on the hind leg of a Cow or Horse is really the heel, while the "stifle" is the knee. What we call the "knee" on the front leg is really the wrist. Consult the picture and text on page 1682.

c. **Examine the teeth of Cattle, Sheep, and Goats.** How do they compare with those of Cats and Dogs? What have they in the place of front teeth on their upper jaws? Remember that the organs for eating and moving are usually the best indications of the habits of animals. If an animal is to survive, these, above all others, must be suited to their task.

B. Horse:

a. **Watch a Horse grazing.** Does it chew its food as it goes? If you have read the article on "Ruminants" mentioned above, you know why the ancestors of the Cows and others developed the extraordinary habit of chewing their cud. What quality has the Horse to make up for the fact that it doesn't chew its cud? Look at its legs. Are they more fitted for running than the legs of a cow? Remember that the big heavy Draft Horses have all been developed by man's breeding, and that Wild Horses are always light and fleet of foot.

C. Hog:

a. **Observe a Hog feeding.** When it wishes to turn over a bit of food to get a better bite, how does it behave? Examine the flat tough end of the Hog's snout. If it is not good tempered, beware of its bite. Its jaws are very powerful. The snout is like a strong sensitive finger. Throw down a single grain of corn, and see how quickly the Hog's nose picks it out. What peculiarity do you find about the teeth of the Boar?

D. Poultry:

a. **Compare the feet and beaks of Chickens and Ducks.** What is each best fitted for? Could a Hen's beak scoop through mud for food as well as a Duck's beak? How many toes has a Duck? How many has a Hen? Can a Duck roost on a broomstick? Can a Hen swim? These questions seem very simple, but if you think about them a little, they will emphasize the marvelous way in which Nature fits every creature for its particular kind of life.

b. **Try to be on hand when a Hen hatches her eggs, or watch the hatching in an incubator.** Notice particularly how bright and active the little chicks are as soon as they break out of the egg. Compare them to young Pigeons. Remember that Chickens are descended from birds which nested and spent most of their lives on the ground, where the young, if they were not quite spry from birth would be at the mercy of every chance foe. Pigeons, on the other hand, are descended from birds that built their nests in high inaccessible places, where the young were comparatively safe. With this in mind, what would you say about the habits of the Turkey's ancestors?

*consult the Easy Reference Fact-Index at the end of this work*

III. WILD BIRDS: 400, 413, 421.

A. **Bird Calendar:** Watch for the return of the birds which have been spending the winter in a warmer climate. Make a "bird calendar" similar to the flower calendar described on page 3849.

B. **Bird Houses:** Build small bird houses, following the suggestions given on page 425. Place them high up in trees near your home or on high posts. Do not, however, have them so close to houses that the birds are frightened away. Keep track in your notes of the time the birds take possession of the house, when and with what they build their nests inside. Egg-laying will begin soon after the birds stop bringing material for their nests. When the older birds begin bringing food to the houses, you will know the young are hatched. Note all of these details, but be careful not to disturb your feathered guests by too close inspection.

C. **Field Notes on Birds:**

a. **Watch for birds' nests on your field trips.** Note the location of each with small sketch maps in your notebook, so you can return from time to time to watch the progress of the feathered families. Notice the size, shape, and color of the eggs. Do not yield, however, to the temptation to collect birds' eggs. A blown egg in a box at home soon becomes most uninteresting, while that same egg left in the nest will quickly turn into a most fascinating youngster, who may have much to teach you.

b. **Try your hand at sketching some of your favorite birds.** Make sketches *from your personal observations.* There is little profit in copying someone else's drawings. Try filling in the outlines of the sketches with water colors.

c. **Learn to identify birds by their song and their manner of flying as well as by their shape and color.** When you discover the name of a new bird, first find out all you can about it by yourself, then look it up in the Fact-Index at the end of this volume.

IV. THE LIFE OF STREAM AND POND:

A. **Keeping an Aquarium: 162.**

**Note:** One of the most delightful ways of studying nature is to keep an aquarium at home. You might begin modestly with a small fruit jar, or you may build for yourself one of the large oblong kind, with plate-glass sides cemented into a wooden or metal frame. If you have skill with tools, you will get most fun and profit making one of the latter, for then you can keep a greater variety of creatures and observe them better through the flat sides. Work out the plans yourself, remembering that it must be very strong to resist the weight of the water and that the joints must be very carefully made so they will remain water-tight. A good cement can be made as follows: Mix one part of white sand, one part of plaster of paris, one part of litharge, one-third part of powdered rosin, with enough boiled linseed oil to make a stiff paste. Fill the corner joints with this and allow a week for it to harden, then paint over the cement with a water-proof varnish, and let water soak in the aquarium for two or three days to wash out any impurities that might be left around the joints. If you intend to keep only two or three specimens at a time, a glass jar or bowl will do very well, but it should be as big around as possible in proportion to its depth, so that a large surface of water is presented to the air.

a. **Plants for the Aquarium:** Gather enough sand to cover the bottom of your aquarium one inch deep at least. Wash the sand clean by stirring it up in a bucket with several changes of water. Go to the nearest wild pool or stream and gather small water-plants, taking a little of the mud or stones on which they are growing. Read the article on "Water-Plants," page 3700, and try to identify all the plants you collect. Arrange them in your aquarium, and let them alone for a few days.

b. **Animals for the Aquarium:** Gather in a bucket or in glass jars any of the water creatures you find in the *same* place where you took the plants. For this purpose, a shallow net of strong mosquito netting, stretched on a cross-stick frame, will do very well. Just comb it through the water-plants or along the muddy bottom.

1. Try to get some Water-Snails (3255), some of the smaller Water-Bugs (3696), some Crawfish (915), and one or two Minnows. These will be enough to start with. If you find strange insect-like creatures in your net which you cannot identify, place them with a few plants in separate jars. They will probably turn out to be insect larvae, such as the larvae of the Dragon-Fly, which are very fierce and would kill your other captives if placed in the same aquarium.

2. If the water in your aquarium tends to become cloudy, you may have too many plants or too many animals. Change the water and try putting in or taking out a few more plants, and watch the result. Experiment in this way until the water remains clear without changing. Such an aquarium is said to be "balanced," the plants providing the oxygen that the animals need and the animals the gas (carbon dioxide) that the plants need. (Read the article on "Respiration," page 2998.)

3. Cover the aquarium with cloth netting or wire screen to prevent such insects as Water-Boatmen and Water-Beetles from flying away. Always keep the water cold. Do not let direct rays of sun shine on the aquarium for long.

c. **Raising Frogs and Toads:** Go to a pond where there are Frogs (1373) or Toads (3506) and collect their jelly-like eggs. Place these in the aquarium, and watch them develop. Note carefully the stages through which each one passes.

# SUMMER

**GUIDING MOTIVE: Summer is the season of greatest strength and activity. The animals and plants, born or awakened in the Spring, are busy with their countless tasks—growing, developing to maturity, preparing for the fruitful tasks of the Fall.**

**I. PLANTS AT WORK:** Review in detail the "Plant Life" article from page 2823 to the last paragraph on page 2829.

**A. Leaves: 1980.** Read this article carefully.

**a. Start a Collection of Leaves.** Follow the detailed directions given for the flower collection on page 3849. Be sure to identify each leaf, noting the principal points which distinguish it from other leaves. Look up the names of the trees or smaller plants to which they belong in the Fact-Index at the end of this volume, and read the references given there.

**Note:** Remember, in looking up the names of plants and animals, that they often have different popular names in different parts of the country. If you cannot find a certain name in the Fact-Index, consult a good dictionary and you will probably find that the plant or animal in question is more widely known under some other name, which will be the one used in these books.

**b. Leaves and Water:** Suspend a drinking glass mouth down over a well-watered growing plant, so that some of the leaves are imprisoned inside the glass. Leave it over night. What do you find on the inside of the glass in the morning? Where did it come from?

**c. Leaves and Light:** Place a house plant, like the Geranium (1435), in a room that has only one window. Examine it a week later. Which way are all the leaves facing? What must you do with a potted plant to make it keep its symmetrical shape in such a room?

**B. Flowers: 1304.**

**a. Select a Few Common Flowers for Study.** Identify the different parts of each flower, as named on page 3849. Remember that these parts vary greatly in size, shape, and arrangement in different flowers. Some plants, such as the Begonia, have two different kinds of flowers: one which has Stamens but no Pistils, called the male or "staminate" flowers; and the other which has Pistils but no Stamens, called the female or "pistillate" flowers. In certain other plants, like the Hop, one plant will carry nothing but "staminate" flowers, while another plant will carry nothing but "pistillate" flowers. But in most of the common wild flowers, Pistils and Stamens are always found in the same blossoms.

1. Touch the Anther at the tip of the Stamen in one of your flowers with your moistened finger. Note the fine yellowish dust that comes off. That is the Pollen.
2. Read the following sections in "The Life of a Flower," beginning on page 1306: Sections 1, 7, 8, 14, 15, 16, 17, 18, and 19. Now cut your flower open carefully and see if you can find the Ovules which must be fertilized by the Pollen grains before a Seed can be formed.

**II. INSECTS AND FLOWERS:**

**A. Color and Scent of Flowers:**

**a.** Bear in mind that the qualities we love most in flowers—their brilliant tints and sweet perfumes—are not really intended for our pleasure at all. They have a very business-like purpose, which you have already read about perhaps on page 1304 and page 2827.

**b.** Remembering this, go out into the country on a warm sunny day and watch the behavior of Bees, Butterflies, and other insects which hover or crawl about the wild flowers. Examine one of the flowers. Could a Bee reach the honey nectar in that flower without touching the Anthers and rubbing off some of the Pollen on its hairy coat? Could that same Bee then visit another flower of the same kind without dropping some of those clinging Pollen grains on the Stigma of that flower?

1. Why shouldn't each flower always pollinate itself, that is, drop the Pollen from its own Anthers upon its own Stigmas, and so produce its own seed? This happens often, of course, but under Nature's general laws of heredity, cross-breeding is necessary from time to time for all higher forms of life if the vigor and health of the offspring are to be maintained. It is this cross-breeding which the insects carry on unconsciously as they fly from flower to flower.
2. Compare a white flower and a red flower by daylight. Which is most conspicuous? Which is most conspicuous at night? Which of the two do you think would be **pollinated** by night-flying insects such as Moths? (See page 2408, last picture in the second row.)

**III. FLOWERS AND THE WIND:**

**A. Some Queer Kinds of Flowers:**

**a.** Find a Pine Tree early in the Summer when the Catkins are well developed. Shake its branches, and watch the yellow dust come down. Now examine the young cone buds, and you will find many of them covered with this yellow dust. Which is the male flower and which the female flower of the Pine? Do flowers always have Petals?

**b.** How is the Pollen dust carried to the cone buds, since the Pine flowers don't attract insects? Do you think the wind is as good a carrier as the insects? Which would waste the most Pollen?

**c.** How many other trees do you know which have flowers without Petals, like the Pine?

**IV. SEED PRODUCTION:**

**A. The Transformation of the Flower:**

**a.** Watch a flower as it fades. What happens to the Petals? Poets often speak of the "tragic death of a flower." Is it really death? Isn't it rather a transformation into new life—the life of the seed? From the point of view of the plant, the purpose of the flower is simply to produce the seed.

b. Make notes of the seed development on the trees and other plants of your neighborhood. What kind of seeds do we call Fruits? What kind of seeds do we call Nuts? How are the seeds of Peas and Beans produced from the flowers?

c. Where are the seeds of the Pine produced? How do flowerless plants, like Ferns, reproduce themselves? Examine the under side of Fern leaves, then read the article on Ferns, page 1232.

V. WHAT PLANTS NEED TO LIVE:

A. Light:

a. Plant a half-dozen Lima Beans in a box or flower pot and put it in a dark place. Give them all the water they need. What color are the young plants after they have straightened up? How long do they live?

B. Water:

a. Plant three separate colonies of Lima Beans. Keep one colony soaked with water; keep the second colony moderately damp; and give the third colony no water at all. Compare the results.

C. Air:

a. Plant some Lima Beans inside a fruit jar and keep the top screwed on tight. You will not have to water them, since no water evaporates. Watch what happens.

D. Minerals:

a. Turn to page 2821, look at the picture entitled "Why Plants Get Sick," and read the text under the picture. This explains why you have to put fertilizer in fields and garden soil after several crops have been grown. Read also the article on Fertilizers, page 1235.

VI. INSECTS AT WORK:

A. What is an Insect?

a. **How many legs has a Fly?** a Grasshopper? a Bee? a June Bug? a Mosquito? a Dragon Fly? an Ant? —Look up the word *Hexapods* in the Fact-Index, and you will find a sure way of identifying all insects.

b. **How many legs has a Spider?** Is it an insect?

c. **Read the Section "How Insects are Made" on page 1787.**

B. Social Insects:

a. **Read the following articles:** Ant, 139; Bee, 359; Wasps, 3690.

b. **Studying Ants at Home:** Get a large fruit jar of the thinnest clearest glass you can obtain. Fill it two-thirds full of moderately damp earth—a soil containing quite a little sand is best. Find a nest of Ants, any one of the smaller varieties that build in the ground, and capture its inhabitants. A good way to do this is to scoop up the whole nest with a garden trowel and spread out the scooped up earth carefully on a smooth piece of ground, using a small paper cone with which to pick up the Ants and dump them into an empty fruit jar. Be careful not to injure them. Pick up all the larvae and pupae you see. The former look like small white worms, the latter like grains of wheat. Also search carefully for the queen, which you will recognize by her greater size.

1. Carry all your captives home and transfer them to the fruit jar which contains the earth. Fasten over the top a fine screen or a paper punched full of large pin holes. Now make a cylinder of heavy black or dark brown paper so it will fit snugly around the outside of the jar, yet be free to slide up and down when you wish it. Put a little sugar, some bits of raw apple, or some tiny pieces of meat in the jar, and set it aside in a window corner, where there is not too much sun, leaving it until you see the Ants have built themselves a new nest.
2. Now slide the paper cylinder down, and you will find the Ants have made most of their galleries down the sides, just inside the glass. They have taken advantage of the fact that the glass offers them support for one side of their tunnels. You may watch the structure of the tunnels for a few seconds, but do not leave them exposed to the light too long, or the Ants will abandon those tunnels and dig in out of sight.
3. Make notes on the way the Ants work, how they eat, how they look after their young, etc. Do not try to recruit your colony by putting in Ants captured from other nests, for these will probably be killed at once by the first settlers. If you wish more Ants, gather only larvae and pupae. These will be welcomed, cared for, and brought up most cheerfully. If at any time the earth seems to be drying up, scatter a few drops of water inside the jar.

C. **Insect Transformation:** Read "In the Fairyland of Change," page 1785.

a. **Caddis Flies:** If you have not already started an aquarium as described on page 3852, it would be well to do so now. Go out to the nearest pond and examine the shallow water near the edges. If you look long enough you will probably see some small bundles of criss-crossed sticks, which move about in a mysterious way. Scoop a few up and carry them home in a jar full of water, and put them in your aquarium. They are the larvae of Caddis Flies (see page 1786). In time they will turn into pupae and then, a little later, they will emerge from the water with wings.

b. **Butterflies and Moths:** Find a Caterpillar with a smooth skin and one with a hairy skin. Take them home together with the leafy twigs or stalks of the plant on which you found each of them feeding. Fill a shallow box with earth and thrust the twigs upright into it, and place the caterpillars on the leaves. Now cover over each of the twigs with a large lamp chimney, pressing the bottom into the soil and covering the top with mosquito netting or other cloth that will let air through. A frame covered with netting will often do as well as the lamp chimney. The caterpillars

should get plenty of light, but not the hot direct rays of the sun. They will soon turn into pupae. If the leaves on the twigs wither, get more twigs of the same kind.

1. Note which one builds a cocoon—the hairy Caterpillar or the smooth one. Which one turns into a Moth and which one into a Butterfly?
2. Read the article "Butterflies and Moths," page 544.
3. Find out the names of your Moth and Butterfly, and look them up in the Fact-Index.

c. **Mosquitoes:** Gather Mosquito eggs, which you will find floating in masses like tiny rafts on the surface of stagnant pools. Or you may capture a few "wrigglers," as the Mosquito larvae are called. You will recognize eggs and "wrigglers" from the pictures on page 2335. Carry them home in a small bucket or fruit jar two-thirds full of water, set them in a shady window, and watch them develop. Do not put them in your aquarium, for they would probably be eaten up by your other guests.

1. Now collect another batch, and as soon as the "wrigglers" are most active, pour a few drops of coal oil on the surface of the water. What happens to the "wrigglers"? Does this suggest to you how to get rid of Mosquitoes in any neighborhood?

VII. BIRDS AT WORK:

A. Bird Survey:

a. **Make a list of the Summer birds living in your neighborhood.** See how many you can add to your list from personal observation. Note in each case the following points:

1. Size and coloring.
2. Song or cry.
3. Where and how they build nests, and the color and shape of their eggs.
4. What they eat—whether insects and worms, or seeds and fruits, or mixed diet. This will require careful observation.

B. Feathers:

a. **Examine all the bird feathers you can find.** What are the soft downy feathers for? What are the stiff smooth feathers for? What else besides flying? Do you think they would shed water as well as the shingles on a roof?

1. Cut up a feather. What do you find inside the quill? Do you think that men could manufacture anything which, for its weight, would be as strong and springy as a feather?
2. Pull apart the "barbs" which make up the flat part or "vane" of the feather. Do they cling together? If you have a magnifying glass, examine the structure of these barbs.
3. Read the article on "Feathers," page 1228.

VIII. FARM ANIMALS AT WORK:

A. Varieties of Farm Animals:

a. **Physical Appearance:** List as many different breeds of Horses, Cattle, Sheep, Goats, Pigs, and Poultry as you can find to observe in your field trips. Note particularly their chief distinguishing characteristics, such as size, shape, and color.

b. **Useful Qualities:** Find out the special value of each breed of farm animals, and the points about each which make it serve its purpose effectively.

## FALL

**GUIDING MOTIVE: Fall is the season of fruitfulness. Plants, which have reached maturity or gained new vitality in the summer months, now put forth their seeds and fruit. New generations of animals are growing up. All of Nature is busy preparing for Winter.**

I. SEEDS AND SPORES: **3171.**

A. Seeds:

a. **Make a Collection of Seeds:** Gather seeds from all the plants you can find in your neighborhood. Note how the seed containers are fastened to the plant.

1. With the article on page 3171 as your guide, list the seeds which are intended simply to fall to the ground, those which are transported by the wind, those which have hooks or barbs to cling to animal carriers.
2. Examine each variety of seed and see if you can tell which are Monocotyledons and which are Dicotyledons. (Refer back to the section on "Sprouting Seeds" of this Outline—page 3849.)

b. **Select Seeds for Next Spring:** Pick out the seeds of the flowers you like best and wrap them in labelled packages to be planted next year. Keep them in a cool dry place.

c. **Fruit.** Read the last paragraph on "Fruit Growing," page 1380.

—Remember that what we call "Fruit" consists simply of seeds enclosed in a pulp which is intended to induce animals to swallow the seeds and drop them again far away from the parent plant.

B. Spores:

a. **Ferns as Examples of Spore-bearing Plants: 1232.** Examine the under side of Fern leaves or "fronds" until you find one covered with little brown dots. These are the "spore cases." What is the difference between Seeds and Spores? (Page 3173.) Do Ferns have Flowers? Remember the purpose of Flowers (page 2827).

b. **Other Spore-Bearers: Mushrooms 2374; Liverworts 2032; Moss 2338.**

II. HOW PLANTS GROW:

A. Trees as Examples of Growth: 3530.

a. **Examine a Fresh Tree Stump:** Note the rings in the wood. You can tell the age of the tree by counting those rings. Which is harder and tougher, the heart-wood near the center or the sap-wood near the bark? Peel off the outer bark and see if you can identify the Cambium. Use the picture on page 3531 as a guide.

b. **How Sap Circulates:** Select on a growing tree a small branch which may be destroyed without harm. With a sharp knife cut off a narrow ring of bark, so as to leave a bare strip completely encircling the branch. Be sure you cut through the Cambium to the woody fiber. Now watch that branch from day to day. Before long it will die from the ring to the tip. What do you learn from that about the circulation of the life-giving Sap?

c. **Leaves and Their Work:** If the leaves are stripped from a plant it will stop growing, and if the stripping continues for long, the plant will die. Why is this? Review the article on "Leaves," page 1980, and read again pages 2823 and 2824 of "Plant Life."

1. Crush a leaf in your fingers. Can you see the green coloring matter (chlorophyll) separating itself from the pulp?
2. What kinds of plants can you find that are not green? Read the articles on Fungi (1382), and Mushrooms (2374). Do you know now why Mushrooms can be grown in dark cellars, where green plants would die?

d. **Autumn Foliage:** Notice when the leaves in your neighborhood begin to change colors in the Fall. How many different colors can you find? Gather leaves from the different trees of your neighborhood after they have changed color, and put them with the Summer leaves in your collection (page 3853).

1. What happens to the Chlorophyll when the leaves change color? (Page 1981.) Remember in this connection that, in the Winter when the leaves are gone, the trees stop growing.
2. Notice, after a leaf falls, how the tree has closed up the place where it grew.

e. **Roots and Their Work:** Dig out any small plant, taking up plenty of soil with it. Now wash off the soil so as not to injure the roots. Examine the fine root hairs. Read the article on "Root," page 3063, and consult the picture on page 2824.

1. Read about the remarkable process of "Osmosis" on pages 2825 and 2826, and if possible perform the interesting experiment shown in the lower picture on page 2823.
2. Study upper picture on page 2821, then read the article on "Fertilizers," page 1235.
3. Are the underground parts of plants always roots? Read "Bulbs, Tubers, and Rootstocks," page 532, and plant bulbs of Chinese Lily, Jonquil, Hyacinth, and Narcissus in flower pots indoors. Plant a Potato, after counting the "eyes," and see how many stalks spring up.

III. ANIMAL STUDIES:

A. Some Unpopular Creatures of the Roadsides:

a. **Spiders and Their Webs: 3320.**

1. Find a Spider web near by. Throw a small twig against it. Does the Spider run out? Make a drawing of the web pattern. Now poke a hole in the web with a stick. Come back the next day, and you will probably find the web mended. Notice by comparison with your drawing how the patch was put in.
2. Notice the difference between the spiral threads and the coarser cross-threads of the web. Which threads are elastic and which rigid? Which threads stick to your finger when you touch them? Can you think why it would help the Spider to have some of the threads elastic and sticky, and others rigid and not sticky?
3. Study the remarkable structure of the Spider from the pictures on page 3323.

b. **Snakes: 3257.**

1. Remember that there are in the United States only four kinds of poisonous Snakes—Rattlesnakes, Moccasins, Copperheads, and Coral Snakes. The other snakes are not only harmless, but usually do a great deal of good to the farmer by devouring vermin.
2. You may examine a common Garter Snake without fear. Note the absence of eyelids. See how the scales on the under side are arranged for catching in the ground and pulling the Snake along. You can feel those little scales pulling if you let the Snake crawl over your hand.

IV. ANIMAL PREPARATIONS FOR THE WINTER:

A. Storing Away Food:

a. **Outside Storage:** Watch a Squirrel during the Fall months. Throw nuts where it can find them. What does the Squirrel do with these nuts? Do you think it will be able to find them all when Winter comes? (3333)

b. **Inside Storage:** If you can catch sight of a Groundhog or Woodchuck in the Fall, you will notice how very fat it is. It is storing its Winter's food inside its body in the form of fat. You often see Squirrels in the Winter. Do you ever see Groundhogs? (1543)

c. **What other animals do you know that hibernate? (1646)**

B. Migration: 2231.

a. **Birds:** Watch during the Fall months for the southward migration of birds. What kinds leave your neighborhood? What kinds pass through your neighborhood from the north?

b. **Other types of Migration: Eel 1089; Salmon 3113.**

# WINTER

**GUIDING MOTIVE: Winter is the season of rest. Most of Nature lies dormant awaiting the call of Spring to burst forth into new life. For those animals which neither migrate nor sleep through this season, Winter is often a period of hard struggle and hunger.**

I. HOUSE PLANTS:

A. Varieties of Plants that Thrive Indoors:

a. **Visit a Greenhouse:** What is the temperature inside? Notice the moisture of the air. What causes this? Make a list of the plants that thrive best in this atmosphere.

b. **Origin of Greenhouse Plants:** Find out the natural home of the various types of plants grown in greenhouses. Read up the article on such plants as Fuchsia (1381), Begonia (371), Hyacinth (1706), Orchid (2593).

c. **How Science "creates" new plants:** Many varieties of domestic flowers are not to be found at all in a wild state. They are specially developed under artificial conditions. Read "Burbank," page 538, and page 2830 of "Plant Life." Read also the second and third paragraphs of "Fruits and Fruit Growing," page 1377.

**Note:** Most of the cultivated plants have undergone such great changes at the hands of man that they cannot live at all in a wild state. They require constant protection against weather and natural enemies. The article on "Weeds," page 3712, brings out the contrast between the pampered plants that we raise for our own profit and pleasure and the independent plant "fighters" which survive and flourish entirely through their own efforts.

B. Care of House Plants:

a. **Select a Few Favorite Plants:** See that they have plenty of good rich soil and that the pots are large enough to allow for the growth of their roots.

b. **The Varying Needs of Plants:** Different plants require different treatment. Some flourish best with abundant sunlight, others require more shade. Some absorb great quantities of water, others are injured by too much moisture. Study the habits of your plants and inquire of greenhouse gardeners about their care. Keep notes on your plants, putting down the date you set them out, their growth and development, and, if they have flowers, the period of blossoming.

II. OUTDOOR PLANTS IN WINTER:

A. Evergreens: **1208.**

a. **Cone-bearing Trees (conifers): 3539.** Make a list in your notes of all the cone-bearing trees you can find in your neighborhood. Read the following articles: Pine 2807; Spruce 3332; Hemlock 1629; Fir 1248; Cedar 670; Cypress 946; Sequoia 3175; Juniper 1902; Yew 3830.

1. Some cone-bearing trees shed their needles in the Winter: Larch 1962.

2. Learn to distinguish the different kinds of cone-bearers. Avoid the common mistake of calling the Spruces, Firs, Cedars, etc., "Pine trees." Do the true Pines make good Christmas trees? Which of the cone-bearers is best for this purpose?

b. **Other Evergreens:** Holly 1673; Laurel 1970.

B. Trees which Lose Their Leaves (deciduous):

a. **Bark Formation:** Winter gives you an opportunity to learn to know trees by their bark. Study the trees of your neighborhood until you can recognize them in this way. In your leaf collection (see page 3853) make sketches of the bark of the tree to which each leaf belongs.

b. **Arrangement of Branches:** Note that the shape and arrangement of branches differ in nearly all species of trees. An interesting experiment for winter field trips consists in guessing the names of trees from a distance, judging merely from the appearance of the branches against the sky, then verifying your guesses by closer inspection of the bark or dead leaves.

c. **Winter Sleep of Plants:** Learn to distinguish annuals, biennials, and perennials (2839). Note that nearly all plants whose *seeds* are used for food are *annuals*, such as corn, oats, beans, peas. Nearly all plants whose *roots* or *leaves* are used for food are biennials, such as carrots, turnips, beets, and cabbages. In the first case the parent throws all of its strength into the seed and dies; in the second the first year's strength is thrown into root, stem, or leaf.

III. PLANT PRODUCTS: **2830.**

A. Wood:

a. **Household Articles:** Make a list of all ordinary household articles which are made of wood.

b. **Wood Structure:** Learn to recognize the varieties of wood by the grain. What causes the grain? (3532 and picture, 3531). Examine a warped board. Which way does the board curve in relation to the grain? Remember that the younger wood always shrinks more than the older wood. Boards, therefore, always curve toward what would have been the "outside" of the tree. Quarter-sawed wood, being cut so as to show the edge of the grain, is much less likely to warp.

B. Cellulose: **673.**

—Make a list of all the ordinary household articles which are made from plant-fiber products.

IV. FOOD: **1320.**

A. **Visit a Grocery Store:** Make a list of all the principal foods, dividing them according to their origin—"Vegetable" or "Animal."

a. **Vegetable Foods:** List separately the vegetable foods that are derived from seeds, fruits, roots, stalks, leaves, flowers.

b. **Animal Foods:** What principal animal foods are derived from living animals?

V. CLOTHING: 805.
- A. Origin of Cloth:
  - a. Vegetable: Cotton 901; Linen 2018; Flax 1291.
  - b. Animal: Wool 3782; Silk 3234.
    —Does the Clothes-Moth eat cloth of vegetable or of animal origin?
- B. Other Materials Used in Clothing.
  - a. Leather 1975; Hair 1559; Furs 1389; Feathers 1228.
  - b. Bone 452; Ivory 1853; Shell 3200; Celluloid 672.

# Picture Aids to Nature Study

NEXT to "seeing things for yourself," the most effective and fascinating way of studying Nature is through good pictures. The pictures listed here are particularly suited to this purpose. They are chosen from the hundreds of Nature illustrations in these volumes because they deal, for the most part, with the broad principles and general aspects of the subject. In addition to those in the list, pictures of almost all the common trees and flowers, of the most important birds and other animals will be found with their proper articles.

## PLANT LIFE

The Parts of a Plant 2822.
The Life of a Flower 1306.
How the Leaf Grows 3532.
How Nature Plays with Leaves 1981.
The "Brain Work" of the Roots 2824.
How Plants Provide for Their Young 3172.
The Circulation System of a Tree 3531.
Looking into the Heart of a Growing Plant 474.
Some of the Varied Forms of Seaweed 3170.
The Curious Life-Cycle of Moss 2339.
Seven Varieties of Nuts 2545.
Biography of a Hickory Nut 1648.
The Early Life of Jack's Bean-Stalk 348.
How Flowers Turn into Peanuts 2701.
Watching the Buckeye Grow Day by Day 2413.
Poisons That Grow in Field and Forest 2853.
Feats of Strength Performed by Plants 2823.

## ANIMAL LIFE

"Hands" for Flying, Swimming, Digging, and Grasping 1572.
Thirty Feet! How Many Do You Know? 1323.
Several Ways of Looking at the World! 1215.
Nature's Fancies in the World of Eggs 1091.
Water Palaces of Porcelain and Pearl 3203.
Glimpses into the Life of Snails 3255.
Some Varieties of Living Sponges 3328.
See What Jelly-Fish Have to Go Through! 1884.
The Parts of a Crawfish 915.
Some Crabs with Strange Habits 913.
Some Parasites and How They Live 2678.
Expert Swimmers of the Insect World 3698.
The Marvels Hidden in an Ant-Hill 139.
At the Front with the Army-Worm 219.
All in the Day's Work of the Worker Bee 361.
Working Tools of Insects 1782.
The Beetle Circus Down by the Pond 367.
The Beetle and Gypsy Moth 368.
Marvels of Butterfly and Moth Life under the Microscope 547.
How the Water "Dragon" Gets Its Wings 1029.
Insect Styles in Footwear 1784.
Birth of the Hornet Moth 1790.
How the Bee Egg Changes into a Bee 1787.
The Hungry Hover-Fly and the Aphid Pests 1791.
Life Story of a Mosquito 2335.
How Mosquitoes Spread Malaria 2337.
Camouflage Among the Six-footed Creatures 1785.
How the Locust Gets Its Wings 1505.
The Robber Barons of Spider Land 3320.
Studying the Spider with a Microscope 3323.
A few of Nature's Fishy Freaks 1273.
Creatures that Walk on Their Ribs 3257.
Armored Cruisers of the Reptile World 3562.
How the Chameleon Catches His Meals 686.
The Life of a Frog 1374.
Telling a Bird's Fortune by Its Feet 409.
Leading Families Among the Bird People 413.
Distinguished Members of the Pigeon Family 2805.
A Group of Fierce Air-Pirates 1606.
Popular Members of the Great Finch Family 1241.
How Birds Practice Camouflage 411.
Some Prominent Families of "Quack Land" 1045.
Distinguished Members of the Owl Family 2606.
How to Make Our Feathered Guests Happy 425.
Across Land and Sea with Animal Travelers 2231.
Picture-Visit to a Beaver Pond 357.
Interesting Members of the Monkey Tribe 2288.
Sleep that Lasts All Winter Long 1646.
Heights at Which Animals Live 397.
The Ages that Animals Reach 126.

# Books for the Nature Student

## FIRST AND SECOND GRADES

Picture Book of Baby Beasts. F. E. Dugdale.
Buds, Stems and Roots. Annie Chase.
Little Nature Studies for Little People. Adapted from Burroughs by M. E. Burt.
Familiar Animals and Their Wild Kindred. John Monteith.
Little Flower Folks. M. M. Pratt.
The Plant Baby and Its Friends. K. L. Brown.
Stories Mother Nature Told Her Children. Jane Andrews.
Friends in Feathers and Furs, and Other Neighbors. James Johonnot.
Short Stories of Our Shy Neighbors. M. A. Kelly.
Stories of Plant Life. Florence Bass.
Nature Stories for Young Readers. Florence Bass.
Sea-side and Wayside—Vols. I, II. Mrs. Julia McNair Wright.
Four Feet, Two Feet and No Feet. Laura E. Richards.
All the Year Round—3 vols. Frances L. Strong.
All the Year Round—Vol. 4 (Summer). M. A. L. Lane and Margaret. Lane.
Eyes and No Eyes.—Arabella B. Buckley.

STORIES AND POEMS

Bed Time Story Book. Thornton W. Burgess.
Nature Myths and Stories for Little People. F. J. Cooke.
Bow-Wow and Mew-Mew. G. M. Craik.
So-Fat and Mew-Mew. G. M. Craik.
Book of Nature Myths. Florence Holbrook.
Little Stories of Little Animals for Little People. Susan Holton.
Nature Myths of Many Lands. F. V. Farmer.
Cat Tales and Other Tales. M. H. Howliston.

## THIRD TO SIXTH GRADES

Bird Stories from Burroughs. John Burroughs.
Birds and Bees, Sharp Eyes and Other Papers. John Burroughs.
Birds that Every Child Should Know. Nellie B. Doubleday.
Little Brothers of the Air. Olive Thorne Miller.
First Studies of Plant Life. G. F. Atkinson.
Plants and Their Children. Mrs. William Starr Dana.
Little Flower People. G. E. Hale.
Wild Flower Book for Young People. Alice Lounsberry
Flowers and Their Friends. M. W. Morley.
Wild Flowers Every Child Should Know. F. W. Stack.
Mother Nature's Children. A. W. Gould.
Boys' Out-Door Vacation Book. A. H. Verrill.
First Lessons with Plants. L. H. Bailey.
How Plants Grow. Asa Gray.
Trees that Every Child Should Know. J. E. Rogers.
Ten Common Trees. Susan Stokes.
Stories of Animal Life. Florence Bass.
Little Beasts of Field and Wood. W. E. Cram.
Little People and Their Homes in Meadows, Woods, and Water. S. L. Hook.
True Tales of Birds and Beasts. David Starr Jordan.
Little Folks in Feathers and Furs. Olive Thorne Miller.
Among the Forest People. C. D. Pierson.
Among the Farm Yard People. C. E. Pierson.
Sea-side and Wayside—Vols. III, IV. Mrs. Julia McNair Wright.
Harold's First Discoveries. John Winthrop Troeger.
First Lessons in Natural History. Mrs. Elizabeth Cary Agassiz.
First Book of Birds. Olive Thorne Miller.
Little Brothers of the Air. Olive Thorne Miller.
Little Wanderers. Margaret Warner Morley.
Bee People. Margaret Warner Morley.
Stories of Insect Life. Clarence Moores Weed and M. E. Murtfeldt.
Seed Travellers. Clarence Moores Weed.
Seed Dispersal. William James Beal.
Neighbors with Wings and Fins. James Johonnot.
Neighbors with Claws and Hoofs and Their Kin. James Johonnot.
Some Curious Flyers, Creepers and Swimmers. James Johonnot.
The Spinner Family. Alice Jean Patterson.
The Prince and His Ants. Luigi Bertelli.
Our Humble Helpers. Jean Henri Fabre.
Story-book of Science. Jean Henri Fabre.
Secrets of Everyday Things. Jean Henri Fabre.

STORIES AND POEMS

A Hundred Anecdotes of Animals. P. J. Billinghurst.
Mr. Rabbit at Home. Joel Chandler Harris.
Just So Stories. Rudyard Kipling.
Crag and Johnny Bear. Ernest Thompson Seton.
Lives of the Hunted. Ernest Thompson Seton.
Black Beauty. Anna Sewell.
Nature in Verse. Edited by M. I. Lovejoy.
Poetry of the Seasons. Edited by M. I. Lovejoy.
Songs of the Tree-top and Meadow. Edited by A. S. Cook and L. B. McMurray.

## SEVENTH AND EIGHTH GRADES

Bird Houses and How to Build Them. Ned Dearborn.
Bird Life. F. M. Chapman.
Bird Ways. Olive Thorne Miller.
How to Attract the Birds. Nellie B. Doubleday.
How to Know the Wild Flowers. Mrs. William Starr Dana.
The Whole Year Round. Dallas Lore Sharp.
A Book of Wood-Craft. Ernest Thompson Seton.
Nature Studies on the Farm. C. A. Keffer.
First Book of Photography. C. H. Claudy.
Photography for Young People. Tudor Jenks.
The Home Aquarium and How to Care for It. Eugene Smith.
Nature Study and Life. C. F. Hodge.
Animal Secrets Told; A Book of Whys. H. C. Brearley.
The Squirrel and Other Fur Bearers. John Burroughs.
American Animal Life. P. G. Hamerton.
Wood Folk at School. W. J. Long.
Wild Animals Every Child Should Know. Julia E. Rogers.
A Watcher in the Woods. Dallas Lore Sharp.
American Animals. Witmer Stone and W. E. Cram.
Pet Book. Anna Botsford Comstock.
Life and Her Children. Arabella Burton Buckley.
Wild Life in Woods and Field. Arabella Burton Buckley.
Bird Neighbors. Mrs. Nellie B. Doubleday.
Sharp Eyes. W. H. Gibson.
Roof and Meadow. Dallas Lore Sharp.
Birds and Bees. John Burroughs.
Nature's Garden. Mrs. Nellie B. Doubleday.
Familiar Trees and Their Leaves. Ferdinand Schuyler Matthews.
Story of the Fishes. James Newton Baskett.
Extinct Animals. Edwin Ray Lankester.
The Book of Forestry. Frederick Franklin Moon.
Animal Life in Field and Garden. Jean Henri Fabre.
Field, Forest and Farm. Jean Henri Fabre.
Insect Adventure. Jean Henri Fabre.
Woodland Tales. Ernest Thompson Seton.
Trails to Woods and Water. Clarence Hawkes.

## HIGH SCHOOL AND AFTER

Blossom Hosts and Insect Guests. W. H. Gibson.
According to Season. Mrs. William Starr Dana.
Guide to Wild Flowers East of the Rockies. C. A Reed.
What Mr. Darwin Saw in His Voyage Around the World. Charles Darwin.
American Natural History. W. T. Hornaday.
Life History of American Insects. C. N. Weed.
Two Years in the Jungle. W. T. Hornaday.
Wild Neighbors. Ernest Ingersoll.
First Lessons with Plants. L. H. Bailey.
Wild Beasts and Their Ways. Sir Samuel W. Baker.
Curious Homes and Their Tenants. J. C. Beard.
Field and Study. John Burroughs.
The Brook Book. Mary Rogers Miller (1902).
The Spell of the Rockies. Enos Abijah Mills.
Adventures of a Nature Guide. Enos Abijah Mills.
Waiting in the Wilderness. Enos Abijah Mills.
Natural History of the Farm. James George Needham.
Music of the Wild. Mrs. Gene Stratton Porter.
Beyond the Pasture Bars. Dallas Lore Sharp.
The Lay of the Land. Dallas Lore Sharp.
Walden or Life in the Woods. Henry D. Thoreau.
The Maine Woods. Henry D. Thoreau.
How Spring Came in New England. Charles Dudley Warner.
Nature for Its Own Sake. John C. Van Dyke.
Studies in Bird Migration. William E. Clarke.
The Bird Book. Chester A. Reed.
Bird Houses. Albert F. Siepert.
Useful Birds and Their Protection. Edward Howe Forbush.
Wild Bird Guests. Ernest Harold Baynes.
My Summer in a Garden. Charles Dudley Warner.
An Island Garden. Mrs. Celia Thaxter.
Old Fashioned Gardening. Grace Tabor.
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Shell Book. Julia Ellen Rogers.
Story of the Forest. John Gordon Doerance.

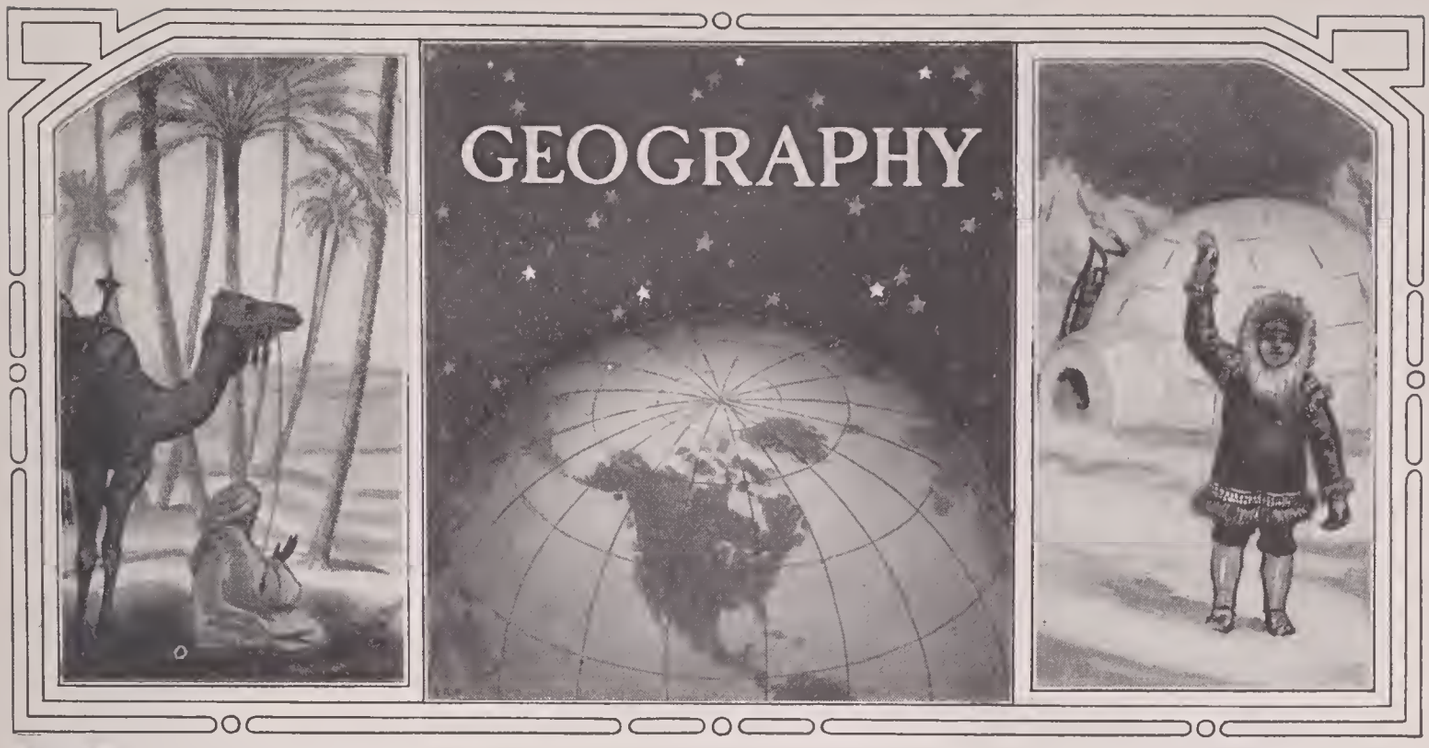
*consult the Easy Reference Fact-Index at the end of this work*

Guide to the Trees. Alice Lounsberry.
Photography Indoors and Out. Alexander Black.
The Insect Book. L. O. Howard.
Our Native Trees and How to Identify Them. Harriet L. Keeler.
Birds Through an Opera Glass. Florence A. Merriam.
Outdoor Studies. James J. Needham.
What Bird is That? F. M. Chapman.
Manual for the Study of Insects. J. H. and Anna B. Comstock.
Our Insect Friends and Foes; How to Collect, Preserve, and Study Them. B. S. Cragin.
Bird Homes. A. Radclyffe Dugmore.
Butterfly Book. W. J. Holland.
Moth Book. W. J. Holland.

# Interest-Questions in Nature Study

"It has a beak like a duck, hair like a cat, and a tail like a beaver. It has four legs and web feet. It lives both on land and in the water, lays eggs and hatches them like a bird, but feeds its young with milk from the breast." What is it? 1046.
What fish are hatched out in a pouch in the body of the male parent? 3165.
Why have certain plants developed the power of catching and eating insects? 2829.
Why have some plants developed poisonous properties? 2852.
What animal spends nearly its whole life hanging upside down? 3252.
How are certain animals able to live all winter without food? 1646.
How many kinds of poisonous snakes are found in the United States? 3259.
How do water spiders get air into their nests at the bottom of ponds? 3326.
Does the flying squirrel really fly? 3334.
What large animal has no voice? 1464.
What bird takes her little ones riding on her back? 1515. What animal? 1130.
What happens to insects in the winter time? 1787.
Why do plants grown in the dark remain white? 2828.
Why do most of the four-footed animals walk on their toes? 1682.
What is the smallest mammal found in America? 2279.
Why have dachshunds such short crooked legs? 1023 (picture).
Why do swallows, unlike most other birds, travel by day when migrating? 3398.
Why do leaves change color in the fall? 1982.
Can a lion climb trees? 2024.
What reptile runs on its hind feet like a man? 2036.
Why do birds migrate in the winter? 401.
Why are most plants green? 2823.
Does a plant get most of its food from the soil or from the air? 3063.
Where do earthworms spend the winter? 1067.
What insects construct "balloons" with which they make long journeys? 3324.
Why are birds' eggs variously colored? 407.
What animals that might have seen the Pilgrims land on Plymouth Rock are still living? 126.
What living animal may have seen Napoleon? 3563 (picture).
Why do many water plants have long slender leaves? 3700.
Why do you see so many earthworms after a rain? 1067.
What do crawfish do when they outgrow their shells? 916.
Do all insects have the same number of legs? 1787.
What animal of the United States carries its young in a pouch, as the kangaroo does? 2585.
What use is the camel's hump? 590.
Can any animals grow new body parts if they are mutilated? 917, 2036.
What familiar tree bears leaves of three different shapes? 3129.
How can you tell poison ivy from the Virginia creeper? 3651.
How does the crawfish care for its young? 917.
How long can a camel go without water? 590.
What is the largest of all birds? 2603.
What does a bird's beak tell you about its habits? 410.
What once common North American bird has been entirely extinct since 1914? 2803.
Why are most male birds more highly colored than the females? 411.
What birds build community nests? 3710.
Are whales fish? 3723.
Are there any birds that do not brood their eggs? 1090.
Which way does an elephant's hind leg bend at the knee—forward or backward? 1126.
What insects sometimes travel in such clouds that they darken the sky? 1504.
How is it that tulips and crocuses are able to get such a start over most other plants in the spring? 532.
Can cats see in total darkness? 657.
Does an elephant use its trunk in fighting? 1127.
Do male birds ever brood eggs? 1145 (picture).
What is the tallest tree in the world? 1186.
How can you tell the age of a colt by its teeth? 1683-4.
Do any coniferous trees shed their leaves in winter? 1208.
Are sponges plants or animals? 3328.
What four-footed animals lay eggs like birds? 266.
What is the only class of animals that grows hair? 1559.
What insect fights with "poison gas"? 368, 370 (picture).
What is the largest land animal that ever lived? 134. The largest sea animal? 3726.
What is the largest creature that has ever flown? 134, 136.
How do insects breathe? 1787, 660-1.
Why are kangaroos found only in Australasia? 1908.
Why might algae be called the "Adams" of the plant world? 92.
What are the "Adams" of the animal world? 118.
How can you tell a plant from an animal? 127, 394.
How can you tell butterflies from moths? 546.
What gives butterfly wings their beautiful coloring? 546.
Was there ever a bird with teeth? 138, 401 (picture).
What are the "ants' cows"? 154.
Why are a bird's bones hollow? 400.
Why should an aquarium contain plants as well as fish? 162.
What insects keep slaves? 142.
How can you tell a fir from a pine? 1248.
Can fishes hear? 1274.
Why does the "doodle-bug" dig holes in the sand? 152.
Do fishes ever change color? 1274-5.
Can any fish travel on land and climb trees? 1273, 1277.
What is the largest of fish? 1276.
What is man's nearest cousin in the animal kingdom? 153.
What purpose is served by the color and fragrance of flowers? 1304.
How can bats "see" with their eyes closed? 345.
Are bats birds? 345.
What makes it possible for a fly to walk on the ceiling? 1312.
Why do beavers build dams? 356.
Are there any reptiles with legs and feet? 2035.
What birds lay their eggs in other birds' nests? 939.
What insect lives 17 years underground and 5 weeks above ground? 764.
Why do sycamores shed their bark? 3424.
Why do whales "blow"? 3724.
What birds get most of their food by robbing other birds? 1372.
What animal absorbs its tail as it grows? 1373.
How does a cicada "sing"? 764. A grasshopper? 1504. A cricket? 921.
What group of plants lives entirely on food manufactured by other plants and animals? 1382.
Why does the holly have thorny leaves near the ground and smooth leaves higher up? 2826 (picture).
Do both male and female mosquitoes bite? 2336.
What advantage have spiral roots over straight roots? 1306.
Can other birds than parrots be taught to speak? 927, 928.
Why does the giraffe have such long legs and neck? 1463.
What plant depends on a moth for its survival? 3835.
What bird mews like a cat? 660.
Which is the largest of all bird families? 1241.
What is the use of the firefly's light? 1263.
How do ants communicate with one another? 139.
What plant is sensitive to noise? 2829.
Why are nearly all fishes bluish on the back? 2923.
What animal "has been responsible for more untimely deaths among human beings than all the wars in history"? 2977.
What animal has a bird friend that acts as sentinel for it? 3006.
What worm is one of man's greatest enemies? 1679.
What bird sings while on its nest? 1543.
Why do ptarmigans grow feathers on their feet in winter? 1544.
Was there ever such a creature as a flying reptile? 134.
Are there any poisonous mammals? 1046.
Why are coconut palms found in so many parts of the world? 818.
What animal is said to "sweat blood" and why? 1651.
Do any of the lower animals have thumbs? 153.
How do snakes hear? 3261.
How long does it take birds to build their nests? 406.
Why do most migrating birds travel at night only? 2231.
What bird travels almost from one end of the earth to the other twice every year? 2231.
What fish kills its prey by "electrocuting" it? 3517.
How much moisture may be evaporated from a tree in one day? 3532.
Why do some plants "go into partnership"? 1994.

*For additional information on topics mentioned in these Outlines*




IF YOU could from memory make an accurate map of every country in the world, placing every mountain, every river, every gulf, every island, every boundary, every city in its exact and proper place, you might still know very little about Geography. This does not mean that maps and map-making are unimportant. On the contrary, it would be almost impossible to study Geography without them. But it does mean that they are nothing more than the *tools* we use in putting together and arranging our really vital knowledge.

You will miss the whole point and fascination of Geography unless you learn to see a map as you see the frame of a picture, which your imagination fills with visions of bold scenery, flowing rivers, cloud-capped mountains, fertile plains, great green forests, and wind-swept deserts. You must learn to hear in your imagination the roar of the surf on distant shores, to feel the bite of the polar cold, and the oppressive heat of the tropics. But, above all, you should see in your mind's eye the millions of people that inhabit the globe, watch them at their work and play, learn what they are all doing, and why. Why have they crowded into great swarming cities here, and why are they scattered in thin settlements there? What are those crops they grow with such care? What are they making in those workshops and in those great factories? What riches are being carried in those speeding railway cars? And those countless ships plowing to and fro over the oceans, where are they bound, and what do they bear beneath their tossing decks? Those are the questions you should ask yourself, and the pictures you should see as you glance at a map.

Geography, as we treat of it here, is the study of the Earth *as the home of man.* Viewed in this light, it becomes a broad and interesting subject. It deals with such things as the races of mankind, their character, and their customs; the influence of climate upon crops and industries; the kinds of plants and animals that thrive in various regions; the ties of trade that bind nations and peoples together; the causes of wealth and poverty in different parts of the world—in fact, with the whole *present* structure of civilization. In so far as the past physical history of the world helps us to understand the present, Geography enters the special field of Geology. And in so far as the past customs of peoples have influenced their present manners, it enters the field of History proper. Political Science, Economics, and every other branch of the "social sciences" are of prime importance to a complete understanding of geographic problems. It is with this idea of the broad interrelations of these topics that this Outline is made. Read, first of all, the article on Geography, page 1413, then follow the detailed Outline.

# Physical Geography

## THE EARTH AS A WHOLE AND ITS RELATION TO THE SUN

I. THE EARTH: 1058.

- A. Its Form and Size: 1063–64.
  - a. Gravitation: 1506.
  - b. Magnetism: 853, 1064.
- B. Motions of the Earth:
  - a. Rotation on Its Axis: 1063.
    1. Poles are points marking ends of Earth's Axis.
    2. Equator is line about Earth's middle, equally distant from Poles.

b. **Revolution Around the Sun: 1063, 2816.**
1. The Earth's Orbit: 1063.
2. Axis not perpendicular to plane of Orbit: 1063.
—This Inclination of the Axis amounts to 23½ degrees from the perpendicular.

C. **Results of Earth's Motions:**
a. **Rotation on Axis causes Day and Night: 969, 1063.**
b. **Revolution around Sun, coupled with Inclined Axis, causes changing Seasons: 1063.** Also causes changes in length of Day and Night.
1. Equinox and Solstice: 1173, 1063.

II. ZONES OF THE EARTH:

—These Zones, like the Seasons, are the result of the Inclined Axis of the Earth. Because of this "slant," the angle at which the Sun's rays strike any point on the Earth's surface varies as the Earth revolves around its orbit. Bear in mind that it is this angle of the Sun's rays which determines the amount of heat that will be absorbed in any region. The more directly the rays strike the surface, the more heat will be absorbed: 794.

A. **The Tropical or Torrid Zone:** the region of greatest heat.
—The Tropical Zone may be defined for purposes of practical geography as that portion of the Earth, where, at some time during the year, the Sun is *directly overhead at noon*, so that the rays strike down perpendicularly: 1968–9.

a. **Extent of Tropical Zone:**
—Since the Earth's axis is 23½ degrees from the perpendicular, the Tropical Zone, of course, occupies a belt 23½ degrees wide on each side of the Equator. This makes the whole tropical belt 47 degrees wide, which amounts on the Earth's surface to about 3,030 miles: 1968–9.

b. **Boundary Lines of Tropical Zone:**
1. North of Equator is Tropic of Cancer: 1968–9.
2. South of Equator is Tropic of Capricorn: 1968–9.

B. **Frigid Zones:** regions of greatest cold:
—The Frigid Zones are those portions of the Earth surrounding the Poles, where, *at least once* in every year, the Sun does not rise above the horizon at noon, and where, *at least once* in every year, the Sun does not sink below the horizon at midnight. At the Poles, the Sun remains continuously above the horizon for six months, and then remains below the horizon for six months: 1968–9.

a. **Extent of Frigid Zones:**
—Just as the Tropical Zone extends 23½ degrees on each side of the Equator, so the Frigid Zones extend 23½ degrees on each side of the two Poles, or 47 degrees in all. Because the Earth is slightly flattened at the Poles (spheroidal), 47 degrees there amount to nearly 3,300 miles: 1968–9.

b. **Boundary Lines of Frigid Zones:**
1. North Frigid Zone bounded by the Arctic Circle.
2. South Frigid Zone bounded by the Antarctic Circle.

C. **Temperate Zones:** regions of moderate heat and cold:
—The two Temperate Zones are those portions of the Earth lying between the Tropical Zone and the Frigid Zones, where the Sun is never directly overhead and yet where it never fails to appear in the course of 24 hours.

a. **Extent of Temperate Zones:**
—Since there are 90 degrees between the Equator and the Poles, 23½ of which are in the Tropical Zone and 23½ in the Frigid Zones, it follows that the two Temperate Zones are each 43 degrees in width, or about 2,960 miles. They are called respectively North Temperate Zone and South Temperate Zone.

## THE STORY OF THE EARTH'S MATERIALS

III. GEOLOGY: 1417; PHYSIOGRAPHY: 2787.

**Note:** Geology deals with the history of the Earth's crust and of the materials which compose it. Physiography deals with the characteristic relief features of the Earth's surface and with the causes which produced them. For the purposes of Physical Geography, these two sciences should be reviewed together, leaving such portions of Geology as deal with the ancient history of *life* upon the Earth to be studied in the Evolution section of the Biology Outline. Here we shall deal first with the physical composition of the Earth under three headings:—*Atmosphere* or Air, *Hydrosphere* or Water, and *Lithosphere* or Rocks and Soil. Then we shall study the changes in the Earth's surface and the agencies which bring them about.

IV. ATMOSPHERE OR AIR:

A. **Nature and Functions of the Atmosphere: 50.**
a. **Chemical Composition of the Atmosphere: 50.**
b. **Weight of Air: 52.**
c. **Air Resistance and Air Pressure: 52.**
d. **Height of the Atmosphere: 51–2.**

e. **How Life Depends upon It: 50.**
f. **How Climate Depends upon It: 50.**
—Effect of Lack of Atmosphere on the Moon: 2318.

B. **Atmosphere and Climate: 794.**

Note: Bear in mind in this section the enormous influence that climate exerts upon the Earth's surface, upon the distribution of plants and animals, upon crops, upon communications, upon customs—in fact, upon everything with which Geography deals.

a. **Temperature: 794.**
1. Definition of Temperature: 1620.
2. Temperature the Dominant Factor in Climate: 794.
3. How the Earth Gets Heat from the Sun: 1619, 3392.
4. Effect of Altitude on Temperature: 794.
5. Effect of Bodies of Water on Temperature: 3693.
6. How Temperature is Measured with the Thermometer: 3486.
7. Temperature and Weather Maps—The Meaning of "Isotherms": 3708.

b. **Moisture: 795.**
1. Moisture in the Atmosphere: 52.
2. Relative Humidity and what it Means: 1207.
—How Moisture is measured with the Hygrometer: 1717.
3. How Moisture Gets into the Atmosphere by Evaporation: 1207, 2972.
4. How the Atmosphere releases Moisture by Condensation and Precipitation: 1000, 2972.
—Clouds 808; Fog 1316; Dew 1000; Rainfall 2972; Hail 1559; Snow 3261; Frost 1375.
5. Effect of Rainfall on Vegetation: 2972.
6. How Rainfall is Measured: 2974, 3708–9.

c. **Pressure of the Atmosphere: 52.**
1. Variations in Air Pressure: 333.
2. How Air Pressure is Measured with the Barometer: 333.
3. The Meaning of "Isobars": 3708.

d. **Movements of the Atmosphere—Winds: 3750.**
1. Causes of Winds: 3750.
2. Effect of Winds on Climate: 795.
3. Relations of Winds and Rainfall: 2972.
4. Various Kinds of Winds and Wind Zones:
—Trade Winds 3750; Doldrum Belt 3750; Westerlies 3750; Monsoons 3751, 1746–7, 2765, Chinook 82, 512; Sirocco 3751.

e. **Storms: 3366.**
1. Cyclones, Hurricanes, and Typhoons: 3366, 944.
2. Tornadoes and Waterspouts: 3366, 3700.
3. Thundershowers: 3366, 2972.
—Lightning: 2006.

f. **The Weather Bureau and Its Work: 3708.**

Note: The climate of any part of the Earth depends, as you can now see, upon two factors—the unchanging factor of Season and Zone and the variable factor of the Atmosphere and its phenomena. In the study of the individual continent and country, you will find practical examples of this principle.

V. HYDROSPHERE OR WATER:

A. **Nature and Functions of the Waters of the Earth: 3693.**
a. **The Importance of Water to All Life: 394, 2824.**
b. **Density and Weight of Water: 1403, 3715.**
c. **Chemistry of Water: 714, 716.**
d. **Behavior of Water when Freezing or Melting: 1618, 1720.**

B. Water Formations:
a. **Oceans: 2553.**
b. **Lakes: 1957.**
c. **Rivers: 3022.**
d. **Springs: 3331.**
e. **Water Formations beneath the Surface: 221, 3331.**

Note: All of the water formations except Oceans will be studied in **Section VII.** The intimate association between Lakes, Rivers, etc., and the Land formations makes it advisable to consider them in that connection, rather than to give them separate treatment here.

C. **Oceans: 2553.**
a. **The Ocean Beds:**
1. Origin of the Ocean Beds: 2788.
2. Character of the Ocean Beds: 2792.

3. Ocean Beds Compared to Continent Masses: 2553.
4. Geologic Changes in Sea Level: 1420.
5. Ocean Depths: 2553, 51, 2617.
   —Exploring Ocean Depths: 2556, 1014, 2778.

b. **Movements of Ocean Waters:**
1. Nature of Waves: 3705.
2. Ocean Currents and Their Work: 2558, 1549, 77.
3. Tides: 3496.

c. **Effect of Oceans on Climate: 794, 2558-9.**

d. **Life in the Oceans: 396, 2555, 2556, 2557.**
1. Corals and Their Work: 884.
2. Phosphorescence: 2776.

## VI. LITHOSPHERE OR ROCK AND SOIL:

A. **Rock Formations of the Earth: 1417.**

a. **Igneous or Unstratified Rock**—comprising all the rocks which have solidified from an intensely heated molten state: 1417.
   —Lava 1971; Granite 1497; Basalt (Fingal's Cave) 3148, (Giant's Causeway) 1809; Quartz 2945; Feldspar 1230; Obsidian 1972; Porphyry 1972; Pumice 1972.

b. **Sedimentary or Stratified Rock**—comprising those rocks produced by deposits of distintegrated matter from the older rock forms, by deposits of animal or plant remains, or by chemical precipitates: 1417.
1. Rock Sediments: Sandstone 3123; Clay 783, 3248; Mudstone 3248; Shale 3248.
2. Animal and Plant Sediments: Limestone 2010; Dolomite 2010; Chalk 685; Coal 811; Peat 2704; Asphalt 234.
3. Chemical Sediments: Gypsum 1554; Salt 3115.

c. **Metamorphic Rock**—comprising ancient sedimentary forms which have undergone profound chemical and structural changes: 1417.
   —Marble 2144; Flint 1292; Slate 3248; Mica 2219.

B. **The Formation of Soil: 3272.**

**Note:** We have seen that the sedimentary rocks were formed for the most part from the disintegrated igneous rocks and from the remains of animals and plants. The same forces of weather and decay which produced those ancient sediments are busy producing the soil which covers the Earth today. And today's soil is on the same road as that silt of bygone ages. The rains wash it away to the rivers and the rivers carry it to the sea, where it is deposited in vast layers one upon the other. In the course of time it will turn into rock again. Thus the rocks and the life of today are the soil of tomorrow, and the soil of today is the rock of tomorrow—if you count your todays and tomorrows as millions of years long. In the picture on page 1421 you will find explained a special form of this everlasting cycle of change.

a. **Chief Forces in Soil Production:**
1. Sun and Rain: 3273.
2. Streams and Ocean Waves: 3273.
3. Winds: 3750, 3273.
4. Frost: 3273.
5. Glaciers: 1466, 3273, 2516.
6. Decay and the Work of Bacteria: 3273, 302.

b. **Principal Kinds of Soil:**
1. Residual Soils—formed by the breaking down of the underlying rocks.
   —Sand 3121; Clay soils from Shale 3273; Limestone soils 2010.
2. Transported Soils—consisting chiefly of "alluvial" soils transported and deposited by rivers, "eolian" soils transported by the wind, "drift" soils transported by glaciers, and "ash" soils composed of ashes ejected from volcanoes.
   —Humus and Loam 3273; Loess 3273, 3750; Drift 2516, 1466, 1721.

# CHIEF FEATURES OF THE EARTH'S SURFACE AND THEIR ORIGIN

## VII. PHYSIOGRAPHY OF THE EARTH:

A. Continents:

a. **Origin of Continents: 2788, 2516.**
1. How Fossils prove that Continents came out of the Sea: 1334, 2516, 3421.
2. Ancient History of Continents:
   —Ice Age: 1720, 1466, 2516.
   —The North Sea, as an example of how parts of ancient continents have been submerged: 2528.

b. **The Continental Shelf: 2788, 2558.**

c. **Irregularities of Continental Outlines and Their Origin:**
   —Peninsulas, Capes, Gulfs, and Bays: 2788.

d. **Comparative Size of the Continents: 2791.**
e. **"Continental" as Opposed to "Oceanic" Climate: 794–5.**

B. **Mountains: 2357.**
a. **Origin of Mountains: 2358, 2790.**
—"Old" and "Young" Mountains: 2789.
b. **Effect of Mountains on Climate: 795, 3588, 512, 2790.**
—Effect upon Rainfall: 2973, 1747.
c. **Effect of Mountains on Human Life: 2358, 2790.**
—How Mountains Play a Part in History: 2515, 3581, 1193, 3302.
d. **Mountains Chief Sources of Minerals: 2248.**

C. **Rivers: 3022.**
a. **Origin of Rivers: 3022-3.**
—Springs: 3331.
b. **The Work of Rivers: 3022.**
1. Cutting Valleys and Transporting Soil: 2791, 3615.
2. Forming Alluvial Plains: 2791, 2266, 3273.
3. Deltas and How They are Made: 2791, 3023.
c. **Effect of Rivers on Human Life: 3022.**
1. Value of Rivers for Transportation: 3524.
2. Their Value for Irrigation: 1828–30.
3. Their Value for Water Power: 3694–5.

D. **Valleys: 3615.**
a. **Origin of Valleys: 2791, 3615.**
—Canyons: 639.
b. **"Old" and "Young" Valleys: 2789, 2791, 3615.**

**Note:** Since Valleys are, of course, always associated with Mountains or Rivers, the preceding sections will have brought out already the chief points for study, which need not be repeated here.

E. **Lakes: 1957.**
a. **Origin of Lakes: 1957, 1721.**
—Formed in Closed Land Basins: 2791.
b. **Influence of Lakes on Human Life:**
1. Ancient Lake-Dwellers: 1957, 771–2, 773.
2. Influence of Lakes on Climate: 1510.
3. Lake Transportation (Great Lakes): 1510.
c. **Salt Lakes: 1515, 2644.**

F. **Plains and Plateaus: 2788, 2790.**
a. **Origin of Plains and Plateaus: 2790.**
b. **Influence on Human Life:**
—Concentration of Population on Plains: 2790.
c. **Various Kinds of Plains: 2790.**
—Tundras 226, 1191, 3085; Steppes 230, 1702, 3086; Savannas 34; Pampas 190, 191, 3285.
d. **Laurentian Plateau as an Illustration of Plateau Features: 1970.**

G. **Deserts:**
a. **The Sahara as an Example of the Origin of Deserts: 3104.**
b. **Characteristics of Other Great Deserts: 228, 3555, 262.**

H. **Islands:**
a. **Origin of Islands: 2788.**
1. Volcanic Islands: 3658, 2621.
2. Coral Islands (Atolls): 886, 2621.
b. **The World's Largest Islands: 468.**

I. **Other Features of the Earth's Surface:**
a. **Volcanoes—Their Origin and Behavior: 3657.**
b. **Earthquakes: 1064.**
c. **Geysers: 1454.**
d. **Caves: 664.**

## HOW THE EARTH'S SURFACE IS MEASURED OFF AND PICTURED

### VIII. THE POINTS OF THE COMPASS: 854.

**Note:** Bear in mind that directions upon the Earth are all related to the Earth's axis, which establishes the North and South Poles. East at any point on the Earth's surface is the direction in which that point is moving around the Earth's axis, and West is simply the opposite direction.

A. **Difference between Geographic and Magnetic Poles: 854, 1064.**

B. **The Compass as an Aid in Determining Directions: 853.**

IX. LATITUDE AND LONGITUDE: 1968.

A. Parallels of Latitude and what They Mean: 1968.
—Length of a Degree of Latitude: 1968.

B. Meridians of Longitude and what They Mean: 1968, 2061.
—Length of the Degrees of Longitudes at Various Latitudes: 2061.

C. How the Latitude and Longitude of a Place is Determined: 2420.

X. MAPS AND MAP-MAKING: 2142.

A. Difficulties of Map-Making:
a. Globes the Only Correct Representations of Earth's Surface: 2142–3.
b. All Flat Maps More or Less Distorted: 2142–3.

B. Map Projections: 2142.
—Conic Projections and Mercator's Projection: 2142.

C. Geodetic Surveys, the Basis for Accurate Map-Making: 3397, 3398.

# RACES OF MANKIND

IN the study of the racial differences existing between the Earth's inhabitants, countless problems arise about their relationships and origin. The chief difficulty encountered by the ethnologists, as the students of this subject are called, is to disentangle the innumerable mixtures and shades of difference that have arisen in the course of ages, and find the basic "types" from which all have sprung. With such difficulties, however, the student of Geography is not primarily concerned. For him it is not so important to know the relationships and origin of peoples as it is to have a convenient method for grouping them according to their present-day customs, their degree of civilization, and their geographical distribution. The grouping followed in this Outline brings out some of the more generally accepted racial affinities, but in the main its purpose is to emphasize the geographical and cultural side of this great subject.

I. ANTHROPOLOGY—MAN'S PLACE IN NATURE: 149.

II. RACES OF MANKIND: 2956.

A. The Many Methods of Classification:
a. Skull Measurements: 2956.
b. Differences in Hair: 1560.
c. Differences in Language: 2956, 2771.
d. Differences in Color of Skin: 2956, 3246.
e. Geographical Distribution: 2956.

Note: The last two are generally used as the basis for classification in the study of Geography.

B. The Races Based on Color and Geographical Distribution: 2956.
a. The Caucasian, European, or White Race.
b. The Ethiopian, African, or Black Race.
c. The Mongolian, Asiatic, or Yellow Race.
d. The Amerind, American, or Red Race.
e. The Malay and Polynesian, or Brown Race.

C. General Characteristics of the Races.
a. The Supremacy of the White Race: 2956–7.
b. The Sudan and Bantu Negroes as Types of the Black Race: 37.
c. The Chinese as Types of the Yellow Race: 740–4.
d. The North American Indian as a Type of the Red Race: 1768–72.
e. The Malays (2130), the New Guineans (2451), and the Polynesians (2620) as Types of the Brown Race.

III. THE WHITE RACE:

Note: Certain peoples, once important in history but now no longer existing as separate groups, have been included in this list. These are indicated by Italic type. The divisions into South Mediterranean and North Mediterranean peoples have no connection with the "Mediterranean Race" described on page 2956 as distinct from the "Nordic" and "Alpine" races of Europe. Those distinctions are definitely ethnological, whereas the one we make here is purely geographic.

A. South Mediterranean:
a. Hamitic—Present-day types found chiefly in North Africa:
—Berbers 2323; *Ancient Aegeans* 28; *Etruscans* or *Tyrrhenians* 1185; *Numidians* 3549; Tuaregs 33, 37, 3105; Copts 1094; Fellahin 1096; Kabyles, Masai, Gallas, Somalis: 37.

Note: The people known today as "Moors" are largely of Berber origin, but Arab and Negro blood is distinctly traceable among them. Historically the term is applied to the Mohammedan invaders of Spain: 2323.

b. Semitic—Present-day types found chiefly in the Arabian Peninsula, Asia Minor, and North Africa:
—Arabs 232; Armenians 212–3; Bedouins 165; *Assyrians* 297; *Carthaginians* 650, 2774; *Hittites* 1669, 234; Israelites (Jews) 1889; *Phoenicians* 2774; *Samaritans, Canaanites* 1890; Syrians 3425; *Philistines* 2770.

B. **North Mediterranean:**

**Note:** The Europeans of today are the chief representatives of this great division, and therefore it is called the "North Mediterranean" branch of the white race. It includes, however, several Asiatic groups as you will see by the Outline. The term "Aryan," which is often used to describe those members of the white race which are believed to have originated in western Asia, is synonymous with "Indo-European" and can properly be used only when people are being classified according to languages: 2771, 224, 1748, 1842, 3040.

a. **Primitive European Types:**
—Basques 3301; Iberians 1343, 3301; Ligurians 1343.

b. **Celts: 673–4, 1152, 1194.**
—Bretons 514; *Britons* 1151; *Gauls* 1343, 3044; Irish 674, 1807; Manx 674; *Picts* and Scots 3147; Welsh 3664.

c. **Italic or Latin Type: 3040, 1842.**
—French 1343–4, 1352; Italians 1840–1; *Latins* 3040; Portuguese 2889; Rumanians (Rumans or Vlachs) 3082; *Sabines* 3040; Spanish 3298–3305.

d. **Illyric Peoples:**
—Albanians 79, 1528; *Illyrians* 79, 1518 (map); *Thracians* 1518 (map).

e. **Hellenic Peoples:**
—Greeks 1520, 1528; *Macedonians* 86, 2096; *Phrygians* 1518 (map).

f. **Lettic Peoples:**
—Letts 1969; Lithuanians 2030; *Baltic* or *"Old" Prussians* 3250.

g. **Teutons: 1194, 3472.**
—East Teutons: Danes 639, 1152; *Goths* 1491; *Northmen* or *Normans* 2525, 1195, 2513; Scandinavians 3134; *Vandals* 3303; *Burgundians* 1194.
—West Teutons: Angles 1152; Dutch 2438; English 1150–4; *Franks* 810, 1195, 1352; Germans 1445–6; *Saxons* 1152, 3132; *Alemannians* 1194; *Lombards* or *Langobards* 2047, 1194.

h. **Slavs: 3250, 1194, 1901–2.**
—Bosniaks 3250, 468; Bulgarians 533; Croatians 271, 307, 1901, 3250; Czechs or Bohemians 948, 447; Montenegrins 2313; Poles 2857, 3250; Slovenians 3250, 1901; Russians 664, 3250, 3088, 3229, Serbs 3176–7, 1901; Dalmatians, Moravians, Ruthenians or Ukrainians, Slovaks, Wends: 3250.

i. **Indo-Iranians:**
—Armenians 213, 664; Baluchis (inhabitants of Baluchistan) 1744, 2735; Kurds 1945, 213, 2735; *Medes* 2191, 2737; Persians 2735; Gipsies 1462–3, 2735, 3558; Hindus 1651, 1748; Ceylonese or Sinhalese 685.

**Note:** The Afghans have an obscure origin, some authorities classing them with the Semitic peoples and some with the Indo-Iranians: 31.

j. **Caucasic Type: 232.**
—Circassians 664, 3558; Georgians 664.

**Note:** The white peoples of North and South America are, of course, not racially distinct from the peoples of Europe. They do not, therefore, find a separate place in this Outline, but will be studied under the various New World countries.

IV. THE BLACK RACE:

A. **Negrito Type: 2434.**

a. **Equatorial Pigmies: 38.**

b. **South African Branches:**
—Bushmen, Hottentots: 37, 3280.

c. **East Indian Groups:**
—Negritos of Philippines 2765; Andaman Islanders 1756; Semangs and Sakais: 2130.

d. **Australian Groups:**
—Blackfellows 261, 266, 2119; Tasmanians 3438.

**Note:** The list of peoples named above present unusual difficulties to the ethnologists. The student is specially cautioned against regarding this arrangement as an implication of true racial affinity. They are grouped together because of their general resemblance to the negro type and because they present on the whole the lowest forms of civilization found in the world today.

B. **True Negro Type: 2434.**

a. **Sudanese Negroes: 37, 35.**

b. **Guinea Coast Negroes:**
—Ashantis: 33.

C. **Negroid or Bantu Type: 37, 2434, 38** (picture).
—Basutos (Natives of Basutoland) 3283; Bechuanas (Natives of Bechuanaland) 3283; Kaffirs 3280, 36; Swahilis 1068; Zulus 3280, 36.

V. THE YELLOW RACE:

A. **Eastern Mongolian Type:**

a. **Southern Chinese: 742.**

b. **Indo-Chinese: 1777, 2130.**
—Anamese 1777; Burmese 540–1, 3015; Siamese 3227; Tonkinese 1777; Shans, Chins, Kackins: 541.

c. **Tibetan Group: 1748.**
—Bhutanese (Inhabitants of Bhutan 1744, 1748); Nepalese (inhabitants of Nepal 1744); Tibetans 1748, 3496, 231.

B. **Western Mongolian Type**—This type is sometimes called "Ural-Altaic:" 3557.
a. **Manchu Group: 746, 2134.**
b. **Mongol-Tatar Group: 2285, 3440, 664.**
—Kalmuks 2286; Cossacks 3228; Tatars 3440; *Huns* 1491, 1704; Kirghiz 230; True Mongols 2285; Turkomans 3555; Turks 3557–8.
c. **Finnish Group:**
—Esthonians or Esths 1180; Finns 1248; Lapps 1962, 1702, 3403; *Avars* 1195, 1702; Magyars 271, 524, 1702; Ostiaks 1702.
d. **Japanese-Korean Group:**
—Japanese 1332, 1862; Koreans 1942.

**Note:** The Ainos or Ainus, inhabiting the Japanese islands of Hokushu and Sakhalin, are descendants of a primitive type very difficult to classify. Some authorities connect these short hairy savages with the ancient stock of the Caucasian or white race.

VI. **THE BROWN RACE:**
A. **Dravidian Group:**
—Gonds, Bhils, Tamils: 1748; Veddahs 685.
B. **Malayan Type: 2130.**
a. **East Indian Group:**
—Dyaks 467; Javanese 1879; Malays 2130; Sumatrese 3391; Igorots 2765–6; Moros 2766.
b. **Madagascar Group:**
—Hovas and Malagasies 2105, 2106.
C. **Oceanic Type:**
a. **Papuan or Melanesian Group: 1072, 2451.**
—New Guineans 2451; New Hebrideans, New Caledonians, Solomon Islanders: 2620; Fijians (in part) 1239.
b. **Micronesian Group:**
—Inhabitants of the Ladrones, Pelew, Caroline, Marshall, and Gilbert Islands: 2620.
c. **Polynesian Group: 2621.**
—Hawaiians 1605; Maoris 2499; Samoans 3120–1; Fijians (in part) 1239; Tahitians, Tongans, Marquesans, and other inhabitants of the more eastern Pacific islands: 2621.

**Note:** Some eminent ethnologists regard the Polynesians as descendants of an ancient Aryan or white stock which came across southeastern Asia and over the waters of the Pacific centuries ago, settling in one after the other of the islands they now inhabit.

VII. **THE RED RACE: 111, 2956.**
A. **Arctic Type:**
—Eskimos and Aleutian Islanders or Aleuts: 1174, 78.
B. **North American Types** (Alaska, Canada, and United States):
a. **Athabascan Group: 1767.**
—Apaches 1767, 2467; Navajos 1767, 202; and many smaller tribes in northwestern Canada.
b. **Algonquian Group: 1765.**
—Arapahoes 844, 1767; Delawares, Kickapoos, Mohicans, Narragansetts, Piankishaws, Potawatomics, and Sacs and Foxes: 1765; Blackfeet, and Ottawas: 1766; Cheyennes, Chippewas or Ojibwas: 1767; Crees 1767, 3129; Miamis 3452; Shawnees 3451–2; Grosventres, Menominces, Micmacs, and Passamaquoddies.
c. **Iroquoian Group: 1766.**
—Cayugas, Cherokees, Hurons, Iroquois, Mohawks, Oneidas, Onondagas, Senecas, and Tuscaroras: 1766.
d. **Muskhogean Group:**
—Apalachicolas, Chickasaws, Choctaws, Creeks, Natchez, Seminoles: 1766.
e. **Siouan Group:**
—Assiniboins, Crows, Dakotas, Mandans, Omahas, Osages, Sioux: 1767; Catawbas, Iowas, Poncas, and Winnebagoes.
f. **Shoshonean Group: 2445.**
—Bannocks, and Utes: 1767; Comanches 844; Hopis or Moquis 202, 1767; Shoshones 1767, 2445; Piutes, Pimas.
g. **Smaller Groups:**
—Among the lesser divisions and tribes which do not fit into any of the preceding groups are the following: Bella Coolas, Chinooks, Kutenais, Maidus, Maricopas, Mojaves, Nez Percés, Nootkas, Pawnees, Snakes, Taos, Wichitas, Washos, Yumans, Zunis, and Flatheads: 1767; Thlingits or Tlinkits 78, 1767.

**Note:** The so-called "Pueblo" Indians did not belong to any single tribe or group, but consisted of several independent stocks in various parts of the Southwest who were distinguished by their settled and semi-civilized life in tribal villages: 2933, 2467.

C. **Mexican and Central American Types:**
   a. **Nahuan Group: 288.**
      —Aztecs 894, 2216 (picture), 288.
   b **Mayan Group:**
      —Mayas 3834–5, 289 (picture).

**Note:** Central America is inhabited by an extraordinary mixture of native races, so confused by foreign blood that a definite separation into groups is almost impossible. In the northern regions of Central America, the Mayas appear to predominate.

D. **South American Types:**
   a. **Chibcan Group**—centering in Colombia.
   b. **Quechuan Group**—centering in Peru.
      —Incas 1741, 2744, 3289.
   c. **Aymaran Group**—centering in Southern Peru, Bolivia, and Northern Chile: **3287** (picture).
   d. **Calchaquan Group**—centering in northern Argentina.
   e. **Araucanian Group**—distributed widely through Chile and western Argentina. This group includes most of the tribes which resisted for so long a time the Spanish invaders: **738.**
   f. **Cariban Group**—distributed over Venezuela, Guiana, and the Amazon delta. Formerly the Caribs inhabited also many of the islands in the Caribbean Sea.
      —Caribs: 3622.
   g. **Tupi-Guarani Group**—centering in Brazil. From the point of view of language this is the most important of the South American groups. Such words as "jaguar," "tapioca" come from the Tupian tongue.
   h. **Arawakan Group**—formerly inhabiting Haiti, Porto Rico, Cuba, The Bahamas, etc., as well as their present home in the Amazon valley. They were the first people of the New World to come in contact with the European discoveries.
      —Arawaks: 3622; Chunchos 2741 (picture), 3287 (picture).
   i. **Patagonian Group**—centering in Southern Argentina: **190, 2692.**
   j. **Fuegian Group**—distributed through Tierra del Fuego (**735-6, 3285**) and extending a short distance north of the Strait of Magellan. These Indians represent the lowest form of savagery found in the New World. They are divided into three types—the Onas, the Yahgans, and the Alakalufs.

# NORTH AMERICA

AS you read this, you should have before you the big map next to page 2515. This will help to emphasize the text, point by point. First of all, we must remember that four centuries ago North America was in a state but little removed from primitive savagery. It had just been discovered by the civilized peoples of Europe, and its size and importance were not even dimly realized. Three centuries ago permanent settlements by white men had been made in only a very few places along the coasts. Two centuries ago the great interior of vast plains and rugged mountain ranges was still a region of mystery. And as late as a century ago only a very few hardy explorers had succeeded in crossing the great breadth of the continent from coast to coast.

Today we see that a swift and almost miraculous change has spread over the face of the land. North America has become the seat of a civilization which rivals Europe in culture and surpasses Europe in material progress. What great influences have been at work to bring about so rapid and magnificent a development? Why has North America so far surpassed South America in this respect, although the European penetration of South America began earlier and progressed far more rapidly at first? These are the questions which the student of North American geography should continually keep before him.

Look at your map. You will notice that the Arctic Circle cuts across the continent far to the north and that you do not meet the Tropic of Cancer until you reach Central Mexico. What does this mean? It means that the great bulk of North America lies in the *temperate* zone, that the climate of this vast sweep of land is moderate, neither very hot nor very cold—such a climate as is best suited to the greatest variety of human enterprises. South America, as you can see by a glance at the map next to page 3289, has its largest area in the *tropical* zone.

Next, we must bear in mind that North America was, at the advent of the white man, very thinly inhabited. Bringing with them the advantages of European civilization, the early settlers were not confronted with the problem of a dense and highly organized population to which they had to adjust themselves. The Indians, bold and intelligent though they were by nature, were wanderers, comparatively few in number, and divided into countless warring tribes. Their resistance soon crumpled before the white man. Thus the Europeans were free to build this new branch of their civilization upon entirely new ground, hampered neither by prolonged native resistance nor by the obstacle of ancient customs and traditions which retarded the development of political and industrial innovations in their home lands.

In contrasting the progress of North and South America it is important to note another great distinction. South America was chiefly colonized by Spaniards and Portuguese, who did not regard the New World as a land to be settled and developed, but who looked upon it merely as a treasure house of gold and silver and other precious products, which was to be exploited for the sole benefit of the governments at home. Among the English, Dutch, and French settlers of North America. however, there were many who sought the New World as a *permanent home,* who strove to develop agriculture, fisheries, and other industries less alluring than the search for gold, but carrying with them a sounder promise for the future.

These are just a few of the most important influences which affected the development of North America. Many others will suggest themselves in the course of this Outline. Watch for them!

## LAND FORMATIONS OF NORTH AMERICA

I. GEOLOGICAL HISTORY

A. **Growth of the Continent: 2516.**

a. **Land Rises from the Ocean: 2516.**

b. **The Great Coal Beds: 812, 3590.**

1. Origin of the Coal Beds: 2516, 811, 158.
2. Formation of Different Kinds of Coal:
—Lignite, Bituminous, and Anthracite: 812.

c. **Origin of Iron and Other Mineral Deposits: 2516.**

d. **The Great Petroleum Fields and Their Origin: 2750–1, 2754–5, 2211.**

B. **Formation of Mountain Ranges and Plateaus:**
—See map showing Heights and Depths, facing page 2514.

a. **The Laurentian Plateau**—extending from northern Labrador to western tip of Lake Superior, and north to Hudson Bay plain: **1970, 2516.**

1. One of the Oldest Land Formations on Earth 1970.
2. Important Mineral Deposits: 1970.

b. **The Appalachian Mountains**—extending from Gulf of St. Lawrence parallel with Atlantic Coast almost to the Gulf of Mexico: **158, 2516, 3580.**

**Note:** The Appalachian chain of mountains includes the following: the highlands of eastern Quebec and of New Brunswick; the highlands of Maine (2125); the **White Mountains** of New Hampshire (2453); the **Green Mountains** of Vermont (3632); the **Berkshire Hills** (2168); the highlands of the lower Hudson River (1692); the **Allegheny Mountains** of Pennsylvania and West Virginia (2160, 3720); the **Blue Ridge** (70, 2160, 3647), consisting of the main range in Virginia, the **Black Mountains** of North Carolina (158), and other spurs into South Carolina and Georgia; the **Cumberland Mountains** of Virginia, Kentucky, and Tennessee (1916, 3466); the **Great Smoky Mountains** of Tennessee and North Carolina (3465); the **Lookout Mountain Ridge** of Tennessee and Alabama (70); and many other divisions variously named. The **Catskill Mountains** of New York (2482) are usually regarded merely as the northern extension of the Allegheny Plateau (*see* below) which has been cut up into hills (2790). The **Adirondack Mountains** (25), on the other hand, are considered as an isolated spur of the Laurentian highlands, cut off from the main Laurentian Plateau by the St. Lawrence River.

1. Evidences of the Great Age of the Appalachians: 2516, 158.
2. The Piedmont Plateau on the Eastern Slope: 3290, 3291 (map), 2160, 2518 (map).
3. The Allegheny Plateau on the Western Slope: 2718.

c. **The Ozark Plateau: 3581.**
—The highlands which make up the Ozark Plateau are regarded as geologically related to the Appalachians. The name **Ozark Mountains** (2616, 2269, 207) is given to the low forested hills forming the northern division of the plateau and extending from southern Illinois, across the southern half of Missouri, into northern Arkansas and northeastern Oklahoma. The **Ouachita Mountains** (208 map, 2574 map, 2576) form the southern tip of the plateau, extending from western Arkansas into eastern Oklahoma.

d. **The Cordillera Ranges: 2515, 3035, 3580.**

**Note:** The Cordilleras include the **Rocky Mountains** (3035), the **Sierra Nevada** (3231), the **Cascade Range** (3686–7, 2594), the **Alaskan ranges** (75, 76), the **Eastern** and **Western Sierra Madre** (2209, 3580), and several lesser ranges of the west.

1. Much Younger Mountains than the Appalachians: 2516, 3036.
—See the picture "The Aged Appalachians and the Young Rockies," page 158.
2. Cordilleras Still Growing: 2517.
—This is the cause of Earthquakes: 2517.
3. Contain Boundless Mineral Wealth: 3035–6, 2210–11, 74.

e. **The Great Basin**—comprising the extensive area between the Rocky Mountains and the Sierra Nevada Range and including the region formerly called the "Great American Desert": **3580, 1064.**

f. **The Great Mexican Plateau**—consisting of the vast stretch of table-land between the two Sierra Madre ranges: **2209, 2515.**

g. **Mountains Due to Volcanic Action: 2515, 3658.**
—Mount Rainier 3658, Mount Shasta 3231, Lassen Peak 3231, Popocatepetl and Orizaba 2209, Mount Katmai 77, and numerous others.

C. Plains:
  a. **The Great Central Plain: 2515, 3581.**
    —In the broad sense used here, the Great Central Plain stretches from the Arctic Ocean to the Gulf of Mexico, including the whole region drained by the Mississippi and its tributaries, as well as the Great Lakes Plain, the Canadian lake region, and the Mackenzie River Basin. In the United States this region is usually divided into the "Great Plains" and the "Central Plains": 3581.
    1. Fossils prove this was once an ocean bed: 2516.
    2. How the land rose and the rivers filled up the shallows with sediment: 2516, 2266, 2791.
      —This sediment makes the Mississippi Valley one of the most fertile regions in the world today: 2265.
  b. **Northern Plain**—between the Laurentian Plateau and Hudson Bay: **1690.**
  c. **Coastal Plains:**
    1. The Atlantic Coastal Plain: 2790.
      —Extending from Cape Cod to Florida.
    2. The Gulf Coastal Plain: 3581, 2209.
      —Extending around the whole Gulf of Mexico from Florida to Yucatan.

D. **The Ice Age in North America: 1720, 2516, 795.**
  a. **Extent of the Ice Sheet: 1720, 1466.**
    —Remnants of the Ice Sheet in Greenland: 2516, 1540.
  b. **Effects of the Moving Glaciers: 1466, 1721, 2516.**
    1. Moraines 1466; Drifts 1721.
    2. How the Ice Sheet helped to form the great North American chain of lakes, including the Great Lakes: 1957, 1721, 2516.
    3. How it blocked and diverted river courses: 1721, 2571, 2253 (picture).
      —The water falls and rapids which provide such a vast amount of water power in the United States and Canada originated in this way: 1721, 2516.
    4. Character of "drift" soil.
      —The bowlders and pebbles of New England: 2516.
      —The highly fertile soil of the Great Lakes region: 2516, 1757, 2253, 2571.

E. **Origin of North America's Present Coast Line: 2517.**
  a. **Up and Down Movements of the Land: 2517.**
  b. **Results of the Sinking of the Northern Coast:**
    —Deep bays and inlets providing fine harbors in the northeast and northwest: 2517, 2790, 510.
  c. **Results of the Rising of the Southern Coast:**
    —Shallow coast with few natural harbors in the southeast, south, and southwest: 2517.

## WATER FORMATIONS OF NORTH AMERICA

II. RIVERS AND LAKES EAST OF THE CONTINENTAL DIVIDE:
—The Continental Divide is the line winding through the Cordillera ranges which separates the headwaters of rivers flowing into the Atlantic and Gulf from the headwaters of rivers which flow into the Pacific:

A. **The St. Lawrence River System and the Great Lakes: 3107, 1510.**
  —The course of this water system lies between the main division of the Laurentian Plateau and the Appalachians.
  a. **Chief Tributaries of the St. Lawrence:**
    —Saguenay 1970; Ottawa 2604; St. Maurice 2947 (picture).
  b. **The Great Lakes:**
    —Superior 3397; Michigan 2227; Huron 1704; Erie 1174; Ontario 2583.

B. **The Rivers of the Atlantic Coastal Plain:**
  a. **Chief Rivers Rising in the Northern Division of the Appalachians:**
    —St. John 3107; Penobscot and Kennebec 2126; Merrimack 2454; Connecticut 2454, 864.
  b. **The Hudson River: 1692.**
    —The Hudson rises in a southern spur of the Laurentian Plateau (Adirondacks) and cuts through to the sea, dividing the Northern Division of the Appalachians from the Southern Division.
  c. **Chief Rivers Rising in the Southern Division of the Appalachians:**
    —Delaware 989; Susquehanna 158; Potomac 2902; James 3648; Roanoke 3648; Neuse 2518 (map); Cape Fear 2518; Peedee and Santee 3291 (map); Savannah 1432; Altamaha 1432 (map).

C. **Rivers of the Gulf Coastal Plain (excluding the Mississippi and Rio Grande River Systems): 1548.**
  a. **Flowing into the Gulf East of the Mississippi:**
    —Suwanee and Apalachicola 1298 (map); Mobile (Alabama and Tombigbee) 72; Pascagoula and Pearl 2262 (map).
  b. **Between the Mississippi and the Rio Grande: 3476.**
    —Sabine, Trinity, Brazos, Colorado (not to be confused with the great Colorado River of the west). Guadalupe, San Antonio, and Nueces 3476.
  c. **South of the Rio Grande:**
    —Moctezuma and Usumacinta: 2209 (map).

D. **The Mississippi-Missouri River System: 2515, 2265, 2273, 3582.**

a. **The Mississippi: 2265-8.**

—Rising from Lake Itasca in the Great Lakes Plain, just west of the extension of the Laurentian Plateau which curves around the tip of Lake Superior.

b. **Tributaries of the Mississippi from the East:**

1. Rivers north of the Ohio:

—Rising from the Laurentian Plateau and the Great Lakes Plain: St. Croix 3770; Chippewa 2266; Wisconsin 3768; Illinois 1730; Rock and Kaskaskia 1731 (map).

2. The Ohio River and Its Tributaries: 2572–3.

—Northern tributaries of the Ohio from the Great Lakes Plain: Wabash 1757; Miami, Scioto, and Muskingum 2573.

—Southern and Eastern tributaries of the Ohio flowing from the Appalachians: Tennessee and Cumberland 3466; Green, Kentucky, Licking, and Big Sandy 1917 (map); Kanawha 3720; Monongahela and Allegheny 2573.

3. Rivers south of the Ohio:

—With the exception of the Yazoo (2261–2), the tributaries of the Mississippi south of the Ohio are unimportant.

c. **Tributaries of the Mississippi from the West:**

1. Rivers of the Missouri rising in the Great Central Plain: Minnesota 2254 (map); Iowa and Des Moines: 1804 (map).

2. The Missouri River and Its Tributaries: 2273–4.

—From the Great Central Plains to the north and east, the Missouri has no tributaries of much importance, the James (3294) being the chief.

—Tributaries from the Great Plains and Rocky Mountains to the west and south: Kansas 1910 (map); Platte 2430; Niobrara 2429; White 3296; Cheyenne 3296 (map); Little Missouri 2524 (map); Yellowstone 3830.

3. Rivers south of the Missouri:

—Arkansas 208 (map), with its two tributaries, the Cimarron 2574 (map), and the Canadian 2574 (map); Red 2576.

Note: In connection with the effect of the Ice Age upon the course of rivers, it is interesting to know that the southern limit of the great ice-cap at that period coincided almost exactly with the great arc formed across the continent by the present course of the Ohio and Missouri rivers.

E. **The Rio Grande System: 3582, 3022.**

—The Rio Grande and its chief tributary, the Pecos (3476), rise near the southern tip of the Rocky Mountain Range. The only important tributary from the south is the Conchos (2209 map), whose waters flow from the Western Sierra Madre.

III. RIVERS WEST OF THE CONTINENTAL DIVIDE:

A. **The Colorado River System: 3582, 845.**

—Through its northern tributary, the Green River (3610), the Colorado derives some of its waters from the region just a few miles west of the headwaters of the Missouri System. Through the Grand (840 map), and the San Juan (3610 map), it reaches almost to the headwaters of the Platte and the Rio Grande respectively. Its southern tributary the Gila (202) flows from the almost desert regions which mark the upper tip of the Sierra Madre.

B. **Columbia River System: 3582, 845.**

—The Columbia itself rises from that part of the Canadian Rockies which also is the source of streams flowing into Hudson Bay and the Arctic Ocean. Its first tributary, the Kootenay or Kootenai (2309 map), rises in the same range. However, through the Clark Fork (846) and Missoula (2309 map), and through its greatest tributary, the Snake (2594), the Columbia River derives much of its flow from that great highland of the Rockies which likewise feeds the Missouri and the Colorado River Systems. Other tributaries are the Spokane (3328), the Okanogan (3687 map), the Deschutes (2596 map), and the Willamette (2594).

C. **The Yukon River System: 604, 3582, 3835.**

—The Yukon drains the northernmost ranges of the Cordilleras, pouring its waters into the Bering Sea. Its chief tributaries are the Lewes, the Pelly, the Porcupine, the Tanana, and the Koyukuk: 3835.

D. **Other Rivers Emptying on the West Coast:**

—You will notice from a glance at the map of North America that, with the exception of the Colorado, the Columbia, and the Yukon, no rivers of great importance empty into the Pacific Ocean. The scarcity of great streams along this vast expanse of seaboard is due to the fact that the great Cordillera ranges crowd so close to the coast that the westward drainage area is small. The water poured down from the western slopes of the Great Divide either gathers into the land-locked lakes such as the Great Salt Lake (1515) and others in the Great Basin, or it wanders about until it finds its way into one of the three great river systems which have managed to cut their way through the coast ranges to the sea.

—The coastal rivers worthy of attention are the Fraser (512) of Canada, the Sacramento-San Joaquin System (581), which drains the west slope of the Sierra Nevadas, and the following rivers pouring from the Western Sierra Madre of Mexico: Sonora, Yaqui, Fuerte, Lerma, and Balsas (2208 table).

IV. RIVERS FLOWING INTO THE ARCTIC OCEAN AND HUDSON BAY:

A. **The Mackenzie-Athabaska River System: 604, 2102.**
—This system includes not only such river branches as the Athabaska and Peace (82), Slave and Liard (2102), but also innumerable lakes of northwestern Canada, of which the most important are Lake Athabaska (3128), Great Slave Lake, and Great Bear Lake (2102)—all of which pour their waters through the Mackenzie into the Arctic Ocean.

B. **The Nelson-Saskatchewan River System: 604.**
—This river system, through the North and South Saskatchewan (3129), derives part of its flow from the Rocky Mountains near the headwaters of the Columbia and of the Milk River tributary of the Missouri. Through its Red River (2986) branch, however, it reaches far to the south near the headwaters of the Mississippi. Among the many lakes which form part of this system are Lake of the Woods (3752), Lake Winnipegosis (map between 602 and 603), Lake Manitoba (2137), and Lake Winnipeg (2986). The waters of this system are discharged into Hudson Bay through the Nelson River (1690).

**Note:** Before leaving the study of North American rivers, you should review them as a whole with the aid of the map, noting the relation between the great mountain ranges and the various great river systems, distinguishing those regions which are abundantly watered from those where few streams are found, and remembering that the course of rivers provides one of the best possible indications about the general slope and formation of the land surface. Bear in mind also the importance of rivers as waterways and as sources of water power, remembering that those which flow across plains are more likely to be navigable, while those through mountains are more likely to provide the swift and tumbling current suitable for power plants.

## CLIMATE, VEGETATION, AND ANIMAL LIFE

V. CLIMATE OF NORTH AMERICA: **794–5, 2515.**

A. **Conditions in the Far North:**
  a. **Labrador's Climate**—Illustrating how the cold belt reaches much farther south on the east coast than on the west coast: **1948, 2558–9.**
    1. Effect of the Arctic winds: 1948.
    2. Effect of the Labrador Current: 1948.
  b. **Alaska and the Yukon Territory: 77, 3836.**
    1. How the land near the coast is warmed by the Japanese Current: **77.**
    2. Cold increases toward interior: 77, 3836.
  c. **Inside the Arctic Circle: 190.**

B. **Conditions in Mexico: 2210.**
—How the hot climate of the coast is tempered in the interior by the altitude of the great Mexican Plateau: 2210.

C. **Typical Temperate Zone Climate of Southern Canada and the United States: 606, 3587–8.**
  a. **Climate of the Great Central Plain:**
    1. Extremes of variation due to the fact that this vast region is open at once to cold winds from the north and hot winds from the south: 3587, 794.
    2. How these extremes are tempered in the Great Lakes region: 1510.
  b. **Climate of the Atlantic Coast and Gulf Plain:**
    1. Effect of the prevailing westerly winds: 3588.
    2. Effect of the warm waters of the Gulf of Mexico: 1548.
  c. **Climate of the Pacific Coast:**
    —Moderating influence of the winds from the Pacific Ocean: 3588.

D. **Rainfall in North America: 3588, 2972–4.**
  a. **Rainfall Map facing page 2514.**
  b. **Effect of Mountains on Rainfall: 2973, 795.**
    1. Appalachians so low that moist winds from Atlantic easily pass over them, carrying rain to the eastern part of the Great Central Plain: 2516.
    2. Cordilleras so high and broad that moist winds from Pacific are quickly cooled and forced to deposit their moisture near the coast: 2517, 606.
    3. This accounts for the arid and semi-arid condition of the Great Basin deserts and of the western plains.

VI. VEGETATION OF NORTH AMERICA: **1327, 3534.**
—See Vegetation Map facing page 2514.

**Note:** The number of small flowering plants and grasses which are native of North America is so great that it would be impossible to list them here. We shall therefore confine ourselves with few exceptions to the characteristic trees and shrubs of the various regions. The mention of a tree as belonging to one region does not mean, of course, that it is confined to that region, but merely that that region is its most natural habitat.

A. **The Arctic Tundras and Northern Barrens: 1948 (picture), 190.**
—Reindeer Moss 1994; Dwarf Willows, Junipers, and Birches.

B. **Southern Labrador, Northwest Canada, and Alaska: 74.**
—White Pine 2807 (picture); Alaska Spruce 74; Tamarack 3539· Birches 399; Alder 85.

C. **Northern Appalachians and Laurentian Plateau:**
—Pines 2807–8; Spruces 3332; Hemlock 1629; Tamarack 3539; Balsam Fir 1248; White Cedar 671; Red Cedar 1903; Juniper 1902; Alder 85; Birches 399; Poplars 2879; Maples 2138: Willows 3742; Quaking Asp 2879 (picture); Beech 364; Ash 225.

D. **Southern Appalachians and Gulf Region: 158.**
—Yellow Pine and Loblolly Pine 2808; Beech 364; Chinquapin 752; Walnuts 3667; Laurel 1970; Persimmon 2740; Papaw and Sassafras 3533; Holly 1673; Catalpa 660; Magnolia 2123; Palmetto 2647; Tulip Tree 3547; Pecan 2705; Tupelo or Sour Gum 3533; Bald Cypress 946; Live Oak 2547; Cane 3386.

E. **Central Mississippi Valley:**
—Red Cedar 1903; Juniper 1902; Oak 2547; Beech 364; Maple 2138; Elm 1138; Chestnut 718; Black Walnut 3667; Hickory 1647; Red Mulberry 2366; Willows 3742; Butternut 548; Buckeye 523; Locust 2045; Sycamore 3424; Sumac 3390.

F. **Great Western Plains, Great Basin, and Cordillera Plateaus:**
—The most characteristic plants of the plains and plateaus are the Cottonwood (2880), and Sagebrush (3103); the semi-desert regions of the Great Basin present many varieties of Cactus (2829), the Yucca (3835), and, further south, certain species of Acacias (4).

G. **Rocky Mountains:**
—The higher slopes of the Rocky Mountains produce principally a wide variety of conifers such as the Western Yellow Pine (2808), Spruces (3332), Hemlocks (1629), and Tamaracks (3539); other trees are Cottonwood and Balsam Poplar (2880), and Willows (3742).

H. **Pacific Coast Ranges:**
—Here are some of the finest evergreen forests in the world: characteristic of the coast ranges of Canada, Washington, and Oregon are the Douglas Fir and Silver Fir (1248), and Western Hemlock (1629); the California ranges have in addition the famous Redwoods (3533), Sequoias (3175), and the Eucalyptus (1186).

I. **Mexican Vegetation:**
—The interior mountains and plateaus of Mexico have much the same scanty vegetation as the plateaus and semi-arid regions to the north: the coastal strips, however, produce a rich tropical growth including Palms (2647), Rosewood (2728), Mahogany (2124), Brazil-Wood (1779, 3284), Ebony (1073), Giant Ferns (1232), Orchids (2593), Agave (42), and a great variety of tropical fruits.

## VII. ANIMAL LIFE OF NORTH AMERICA:

A. **Mammals: 2132.**

a. **Deer Family: 979.**
—American Elk or Wapiti 3669; Virginia Deer 980, 981 (picture); Mule Deer 980 (picture), 981; Black Tailed Deer 980; Moose 2325; Caribou or Reindeer 76 (picture).

b. **Ox, Sheep, and Antelope Group: 3198, 146.**
—Bison or "Buffalo" 428; Musk-Ox 2383; Rocky Mountain Sheep 3198; Rocky Mountain Goat and Pronghorn Antelope 146.

c. **Dog Family:**
—Coyote and Gray Wolf 3774; Red Fox 1336; Silver Fox, Arctic Fox, and Gray Fox 1337.

d. **Bear Family: 349.**
—Polar Bear, Grizzly Bear, and Alaska or Kadiak Brown Bear 355; American Black Bear 350.

e. **Weasel Family:**
—Wolverine 3776; American Marten 2156; Weasel 3707; Ferret 1234; Mink 2251; Skunk 3246; Badger 303; Otter and Sea Otter 2605.

f. **Cat Family: 658.**
—Cougar, Puma, or Mountain Lion 2933–4; Jaguar 1859; Ocelot 1989; Canada Lynx and Wild Cat or Bob Cat 2087.

g. **Rodents or Gnawing Animals: 3036.**
—Gray Squirrel and Flying Squirrel 3333; Red Squirrel, Fox Squirrel, and Ground Squirrel 3334; Chipmunk 752; Woodchuck 1543; Prairie-Dog 2912; Beaver 356; Porcupine 2883; House Rat and Wood Rat 2977; House Mouse and Field Mouse 2359; Muskrat 2384; Kangaroo Rat 1908; Jumping Mouse 1647; Pocket Gopher 1488; Polar Hare 1585; Varying Hare or "Snowshoe Rabbit," Prairie Hare or "Jack-Rabbit," and Cottontail Rabbit 1584.

h. **Other Mammal Groups:**
—Peccary 1671 (picture), 2706; Raccoon 2951; Armadillo 211; Mole 2278; Shrew 2279; Brown Bat and Red Bat 346; Opossum 2585, 1908.

B. **Birds: 400.**
—Birds peculiar to North America: Wild Turkey 3556; Mocking-Bird 2274, 419 (picture); Robin 3028, 420 (picture); Baltimore Oriole 2600 (picture), 2601; Bobolink 446; Cowbird 433, 404 (picture); American Flycatchers 1313, 417 (picture); Cat-Bird 2410 (picture); Sage Hen 1545. These and other characteristic American birds will be found pictured and described beginning on page 413.

C. **Reptiles and Amphibians: 2997.**
—Horned Toad and Gila Monster 2037; Iguanas 685; Rattlesnakes 2978; Copperhead 884, 3258 (picture); Moccasin 2274, 3258 (picture); Coral Snake 3260, 3258 (picture); Alligator 98; Crocodile 922; Terrapin

3563; Box Tortoise 3562; Snapping Turtle 3563; Leopard Frog 1373; Bullfrog, Tree Frog, Peeper 1375; American Toad 3507; Salamanders 3112; Newts or Water-Dogs 3113.

Note: North American snakes other than those mentioned on preceding page will be found described in the article on Snakes, page 3257.

D. **Fish: 1271, 1278-9.**
—Salmon 3113; Eel 1089; Sunfish 1279; Trout 3545; Whitefish 3733; Striped Bass, Bluefish, and Cod 1278; Haddock 1558; Halibut 1565; Mackerel 2102; Pompano and Redfish 1279; Shad 3188; Smelt 1279; Tarpon 3438; Tuna 3552; Tilefish 1279; Flounder 1301, 1289; Flying Fish 1314; Sawfish 3131; Sharks 3196; Skates or Rays 3244; Swordfish 3423.

E. **Insects and Allied Groups: 1789.**
—The number of North American insects and similar creatures is so great that we shall list here only those which, by their depredations, play an important part in the agricultural life of the continent: Aphids 154; Grasshoppers 1503; Locusts 2045; Chinch Bug 752; June Bug 1902; Hessian Fly 1645; Potato-Bug 2902; Weevils 3713; Army-Worm 218; Codlin Moth 820; Cankerworm 630; Cutworm 944. A few others will be found mentioned in the article on Beetles, page 366.

## MANKIND IN NORTH AMERICA

VIII. DISCOVERY AND EXPLORATION:

A. **Early Visits of the Northmen: 109, 2526-7.**
B. **Columbus and His Voyage: 846, 109.**
—How Sugar Helped Discover America: 3385.
C. **How America Got Its Name: 3634.**
D. **Three Hundred Years of Discovery after Columbus: 109-10.**
a. **John Cabot, the First to Reach North America: 561.**
b. **Ponce de Leon and the "Fountain of Youth": 2878, 1295.**
c. **How Cortez Conquered Mexico for Spain: 894, 288.**
d. **How Cartier Opened the Gateway of Canada for France: 651.**
e. **De Soto and His Adventures on the Lower Mississippi: 999.**
f. **Coronado, the First White Man on the Great Plains: 892.**
g. **Sir Walter Raleigh's Ventures in the New World: 2974.**
h. **Henry Hudson and His Great Discoveries: 1690.**
i. **Champlain and the Founding of Quebec: 687.**
j. **The Exploration of the Mississippi:**
—Marquette 2151; Joliet 1900; La Salle 1964; Hennepin 1632.
k. **Daniel Boone Penetrates the Wilderness: 464.**
l. **The Famous Lewis and Clark Expedition: 1989.**

IX. PEOPLES OF NORTH AMERICA:

A. **Original or Native Population:**
a. **Prehistoric Races:**
1. Mound Builders: 2357, 1767.
2. Cliff Dwellers: 793.
b. **Natives Found by White Men:**
1. Eskimos: 1174.
2. Northern Indians: 1765.
3. Mexican Types:
—Aztecs 288; Mayas 3834.

B. **White Population:**
a. **Early Settlers:**
1. The Spaniards:
—In Mexico 2214, 2219; in Florida 1295; founding of St. Augustine 3106; in New Mexico 2466; in Texas 3478; San Antonio 3121; in California 580; San Diego and San Francisco 3124; Los Angeles 2063; in Arizona 202.
2. The French:
—In Canada 617; on the St. Lawrence River 617; founding of Quebec 2948; Montreal 2317; on the Great Lakes 1514; in Wisconsin 3772; in Illinois 1736; in Michigan 2226; Detroit 999; in Louisiana 2072; New Orleans 2471; in Missouri 2272.
3. The Dutch:
—In New York 2486; in Delaware 989.
4. The English:
—In North Carolina 2520; in Virginia 3650; Jamestown 1861; in Massachusetts 2170; Plymouth 2164, 2175; Puritans 2937; in Rhode Island 3009; in Maryland 2163; in South Carolina 3292; Charleston 699; in Pennsylvania 2720; Philadelphia 2760.

Note: The political history of these early settlements, and how they finally merged into the states and nations of today can be studied best by reference to the History Outlines.

b. **Later Immigration to North America: 3579, 3581, 610, 617.**
c. **Negroes Imported as Slaves: 2434.**

# THE GREAT NATURAL REGIONS OF THE UNITED STATES




Here we see the eight great natural regions of the United States, with three subdivisions. Mastery of this regional grouping is important to the student of geography, because not only does it determine physical features, such as the flow of rivers, but to a great extent indicates the activities pursued by the people within the regions. As we might expect, agriculture rules the plains regions. The Gulf Plain raises products suited to a warm climate. The Central Plains produce crops typical of a temperate climate, and the Atlantic Plain shades from one to the other. The Great Plains, due to their comparative lack of water, are more suited to cattle raising — and the lack of water may be understood from the map, because the mountains farther west block off the rains from the Pacific. In similar ways, the physiography of the other great regions shown exercises profound influence upon the lives of their people, as explained in the Outline.

*For additional information on topics mentioned in these Outlines*

3876

C. **Distribution of Population and Its Causes:**
—See Population Map facing page 2514.
a. **Fine Harbors on East Coast Attract Settlers: 2514.**
b. **Influence of Fisheries on Colonization: 1283.**
c. **Influence of Fur Trade on Exploration: 1389.**
d. **Appalachian Mountains Halt English Settlers: 158, 2515, 3581.**
—But this proves more fortunate than the rapid scattering of Spanish and French settlements, for it helps to weld the colonists together: 2515.
e. **How Settlement Spread Beyond the Appalachians: 158.**
f. **The Lure of Gold Leads Men over Plains and Mountains: 2515.**
g. **Factors in the Permanent Settlement of the Continent:**
1. The discovery of its vast natural resources: 2515.
2. Areas of Barren Land comparatively small: 2515.

D. **The Story of the Seven Strands of the Rainbow: 3582.**
—This is the story of the United States and of the influences which helped to bring about its remarkably rapid and prosperous growth. Read this story carefully before going on to the next Outline, which takes up the United States, region by region.

# UNITED STATES

THE DEVELOPMENT of the United States during the last century is one of the marvels of civilization. Nowhere has such a vast tract of wilderness been so rapidly conquered. In growth of population, in industrial progress, in the creation of material prosperity, the record of this country has never been equalled. Natural conditions strongly favored this development. The territory which came into the possession of the United States occupied the heart of the temperate zone; the varied climate and fertile soil permitted the cultivation of nearly every kind of crop; the natural resources—minerals, timber, water-power, etc.—were abundant and widely distributed; the coast-lines, divided between the two great oceans, encouraged commerce with Europe and Asia.

Here, indeed, was the land of opportunities. And the people who came into this favored land were of a kind to take advantage of these opportunities. First, we see the early colonists and their descendants—men of bold, liberty-loving stock, who framed the ideals of the new nation. Then came enterprising seekers after freedom and fortune, pouring in from every part of Europe—farmers, tradesmen, miners, skilled artisans, laborers, professional men, students, representing every class and creed. Differing widely in racial temperament, in traditions, and in training, they amalgamated to form a versatile population ready to meet any emergency and to fit into any enterprise which their adopted country might set before them.

The study of the natural resources of the country and of the multitude of uses to which they have been put by the labor and inventive genius of the people—these are the most interesting and important points in the Geography of the United States. From this point of view, the territory of the United States can be roughly divided into several *natural regions*, each of which is particularly adapted to certain classes of industries and occupations. The boundaries of these natural regions, however, do not usually coincide with state boundaries. For this reason the tendency in American schools has been to abandon the old method of studying the states one by one or in definite groups. Instead, they make a survey of the country as a whole, noting the characteristics of each natural region, the influence each region exerts upon the life of the people dwelling in it, and the contribution each region makes to national strength and prosperity. The same method and spirit is followed in this Outline. Those wishing to study any of the states by themselves will find full geographical and historical details gathered together in each state article.

## NORTHERN DIVISION OF THE APPALACHIAN HIGHLANDS

THIS region, which includes all of New England, is today essentially a manufacturing district. The surface of the land is generally broken and rocky, the only portions suitable for farming on an important scale are the narrow river valleys and lake bottoms. The result is that New England has to import a large proportion of its foodstuffs and the raw materials for its great textile industries. The extensive forests in the north contribute chiefly the wood-pulp used in the paper mills. While poor in metals, the rock-ribbed hills of the interior yield building stone of great value. An inexhaustible source of power is found in the swift streams. But it is not by reason of its natural resources that New England occupies such an important place in the life of the United States, but because of the energy and enterprise of its citizens who have built up great industrial and financial centers where a large proportion of the national and international business is transacted.

I. **BOUNDARIES AND AREA:**
A. **Hudson River and Lake Champlain on the west; Canada on the north; the Atlantic Ocean on the east; and Long Island Sound on the south.**
B. **Area includes the six New England states—Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island—and the narrow strip of New York east of the Hudson.**

II. PHYSIOGRAPHY:
—The geological formations of the Appalachian regions are fully revicwed in the Outline on North America. Here we shall examine merely those physical details peculiar to the northern or New England Division.
A. **Important Mountains:**
a. **White Mountains 2453; Green Mountains 3630; Berkshire Hills 2168.**
b. **Mount Washington the Highest Peak 2453.**
B. **Effects of the Ice Age in New England: 1720, 3632.**
C. **Effects of Sinking of the Land upon the Coast-line: 2517.**
D. **Rivers and Lakes:**
a. **Principal Rivers:** Connecticut 864, 2454; Penobscot 2126; Merrimack 2454; Androscoggin and Kennebec 2125.
b. **Numerous Lakes, Mostly Small**—Largest Lakes: Lake Champlain 3632; Mooschead Lake 2128.
E. **Soil—Great Variation in Quality: 2126, 864, 2169, 3007, 3632.**

III. CLIMATE:
A. **Sharp Seasonal Changes: 2516, 2128, 3632.**
B. **Abundant Rainfall: 3588, rainfall map opposite page 2514.**

IV. NATURAL RESOURCES:
A. **Good Natural Harbors: 2517, 2125.**
—Boston 469; Portland 2128; Fall River 1223; New London 866–7; New Haven 2456; Providence and Newport 3008, 2927; Portsmouth 2454; Bridgeport 510; New Bedford 2448; Bath 2126.
B. **Numerous Streams, Waterfalls, and Rapids:**
a. **Abundant Water-Power: 863, 2126, 2169, 2454, 3008.**
—Large water-power sites: Lawrence 1973; Lowell 2075; Nashua and Manchester 2454; Concord (N. H.) 2455; Lewistown 2128; Fall River 1223; Holyoke 2165: Pawtucket 3007, 3008 (picture); Woonsocket 3010; Burlington and Montpelier 3633.
b. **Inland Navigation:**
—Important cities situated at the head of navigation: Hartford on the Connecticut 867, 1595; Augusta on the Kennebec 2126; Bangor on the Penobscot 2126.
C. **Forests: 1327, 2126, 3632, 2454, 866.**
D. **Minerals:**
—Marble, Granite, Limestone, Slate: 3633, 2128.
E. **Fish, Oysters, Clams, Lobsters: 1283, 2166, 2128, 3008.**
F. **Some Good Agricultural Land: 864, 2126, 2454, 3632.**
G. **Beautiful Scenery: 2125, 2168, 2453, 3633.**
—Notable Summer Resorts: Newport 3008, 3010 (picture); Bar Harbor 2128.

V. CHIEF INDUSTRIES:
A. **Manufacturing the Leading Industry:**
a. **Textiles:** Woolens and Cotton Goods 1973, 863, 2165, 2454; Silks 863, 3007.
b. **Wood Products:** Wood-Pulp and Paper 2454, 2126, 2165, 1973.
c. **Boots and Shoes:** 2165, 2454, 2126.
d. **Food Products:** Canning 2126; Maple Syrup and Maple Sugar 3632, 2138.
e. **Miscellaneous Manufactures:** Brassware, Plated Ware, and Cutlery 863; Machinery and Leather Goods 2166; Clocks and Watches 863; Firearms 1595, 2456, 863; Jewelry and Silverware 2927; Wire 3787, 2166; Rubber Products 863.
B. **Lumbering: 2126, 2454, 3632.**
C. **Quarrying and Mining:**
—Granite and Marble Quarrying 3632, 2454, 2128, 2944 (picture); Limestone, Slate, and Talc 3633, 3590; Feldspar, Lime, Cement, Iron 866.
D. **Fisheries: 2166, 3008, 2454, 2128, 864.**
E. **Shipbuilding: 2126, 863.**
F. **Agriculture:**
—Hay 2126, 3632, 864; Apples and Pears 2126, 3632, 864; Blueberries 2126; Potatoes 2126, 3632; Garden Vegetables 864, 3007, 2454; Tobacco 864, 3509.

VI. PRINCIPAL CENTERS OF MANUFACTURING AND TRADE:
—Boston 469–73, Providence, 2927, Worcester 3787, New Haven 2456, Bridgeport 510, Hartford 1595, Springfield 3332, New Bedford 2448, Fall River 1223, Lowell 2075, Cambridge 587, Lynn 2087, Lawrence 1973, Somerville 472, Waterbury 864, Portland 2128.

## THE ATLANTIC COASTAL PLAIN

WHEREAS the Appalachian Highlands in the north reach to the Atlantic Ocean, forming the rocky and broken coast of New England, their southern ridges and plateaus are separated from the sea by a strip of lowland which geographers call the Atlantic Coastal Plain. This plain is composed of layers of soil washed down from the ancient mountains. A natural boundary called the "Fall Line" separates this region from that part of the Appalachian Highlands known as the "Piedmont Plateau." Here the rivers, emerging from the western hills, plunge in falls or rapids to the plains below, at the same time putting an end to up-stream

navigation from the sea and providing a rich source of water-power. The Atlantic Coastal Plain is at once a manufacturing and an agricultural region. Its chief manufacturing and trade centers are grouped around the great natural harbors to the north; its agricultural districts become increasingly important toward the south.

I. BOUNDARIES AND AREA:

—Cape Cod, Marthas Vineyard, Nantucket Island, Long Island, and Staten Island are portions of the Atlantic Coastal Plain which, when this part of the coast sank and let in the sea, were cut off from the remainder. The mainland plain includes southern New Jersey, Delaware, the eastern sections of Maryland, of Virginia, of North Carolina, and of South Carolina, the southern half of Georgia, and the eastern coast of Florida. New York City and Philadelphia, although they are not, strictly speaking, in coastal plain territory, are included here because their commercial life is so closely linked with the Atlantic seaboard.

II. PHYSIOGRAPHY:

A. General Characteristics of the Surface:

a. Flat and Inclined to be Swampy near the Coast: **987, 3647, 2518, 3290, 1431.**

b. Elevation above Sea-level less than 500 Feet: **2457, 988, 3647.**

B. Contrasts in the Coast-line:

a. Effects of the Sinking of the Land in the North: **2790, 2517.**

1. Great Bays and Wide River Mouths: Delaware Bay 989; Chesapeake Bay 716; New York Bay (Hudson River mouth) 1692; Hampton Roads (mouth of the James River) 3647; Potomac River mouth 2902.
2. Islands and Sounds: Marthas Vineyard and Nantucket Island 2170; Long Island 2061, and Long Island Sound 2482; Manhattan Island 2488; Albemarle and Pamlico Sounds 2518.

b. Effects of the Rising of the Land in the South:

1. Regular coast-line with no large bays or inlets: 2517.
2. Low sandy shores and swamplands in many places: 3290, 1431 (Okefinokee Swamp), 1298 (Everglades).

C. Chief Rivers:

—Delaware 989; Potomac 2902; Rappahannock, York, James, and Roanoke 3648; Cape Fear River 2518; Savannah 1432; Altamaha with its two tributaries, the Oconee and Ocmulgee 1432 (map); St. Johns River 1297.

D. Character of the Soil:

a. Light and Sandy: **640, 2460, 987, 1298.**

b. Flat and Rich: **987, 3290, 1431.**

III. CLIMATE: **3588.**

A. While rainfall is fairly abundant and evenly distributed over this region, there exists a great contrast in temperatures between the northern and southern portions. The extent of this variation may be judged from the fact that great summer resorts exist in the north, while famous winter resorts abound in the south.

B. Effect of Gulf Stream 255: Violent Coastal Storms 2518.

IV. NATURAL RESOURCES:

A. Good Farm Land: **640, 2460, 987, 1298, 3290, 1431.**

B. Minerals: **Phosphate Rock 3291; Clay 2458, 987, 2162, 3292, 1433; Kaolin 2519 (picture); Sand of Fine Quality 2460; Fullers Earth 1298.**

C. Forests: **Pine 2457, 2519, 3292, 640, 1432, 1297; Cypress 3292; Oak 640.**

D. Fish: **Shad 3188; Pompano 1279; Spanish Mackerel 2160.**

—Oysters, crabs, and terrapin 2160, 3648.

E. Natural Harbors and Navigable Rivers: **987, 1296, 3647, 2457.**

F. Water-power: **2519, 3290, 1432.**

—The water-power available on the Atlantic Coastal Plain is virtually all developed at the Fall Line where the streams from the Appalachians plunge downward from the Piedmont Plateau. In this sense it really belongs to the upland regions rather than to the plain. There have grown up, however, along this Fall Line, many important industrial centers which owe their prosperity not only to the available water-power but also to the fact that they are situated at the head of the navigable streams of the plains region.

V. INDUSTRIES:

A. Agriculture:

a. Truck Farming and Fruit Raising in the North: **987, 2457, 2160, 2518, 3648.**

—Intensive cultivation of the soil in the vicinity of large cities to supply their markets.

b. Fruit Growing in the South: **1431, 1297.**

c. Corn an Important Crop: **2518.**

d. Cotton: **3290, 2518, 1431.**

e. Tobacco: **2519, 3648.**

f. Other Crops: **Rice 3291; Peanuts 3648; Sugar Cane 1431; Pecans 1431.**

B. Manufacturing: **2496, 2457, 3650, 2519, 1432, 987, 2162.**

a. Cotton Products: **3650, 2519, 1432.**

b. Wood Products: Lumber 3650; Furniture 2519, 1432; Paper and Wood-pulp 987; Charcoal and Lampblack 1432; Turpentine, Resin, Tar, Pitch, and Creosote 2519, 1432.

c. **Miscellaneous Manufactures:** Silk 2458; Clothing 2162; Leather 3650, 987; Linoleum and Oil Cloth 2458; Shipbuilding 2458, 987, 2762, 3743; Explosives 3743.
d. **Manufacturing Favored by Position near Coal Fields: 2457.**

C. Trade and Transportation:
a. **Means of Transportation:** Railroads 2495, 2162, 1296; Rivers 1296, 3648, 987, 2518, 3292; Canals 640, 987.
b. **The ports of the Atlantic Coastal Plain are the principal gateways for trade with Europe: 2496, 2762, 322, 3743, 2513.**

VI. IMPORTANT CITIES:
A. **Seaports:** New York City 2487; Philadelphia 2760; Baltimore 332; Jersey City 1884; Richmond 3018; Wilmington (Del.) 3743; Norfolk 2513; Elizabeth 2457; Jacksonville 1858; Hoboken 2457; Savannah 3130; Charleston 699; Wilmington (N. C.) 2520; Newport News 3650.
B. **Industrial Centers on the Fall Line:** Trenton 3540; Columbia 3290; Augusta, Milledgeville, Macon, and Columbus 1431.

## SOUTHERN DIVISION OF THE APPALACHIAN HIGHLANDS

HERE WE HAVE one of the busiest mining and industrial regions in the world. Coal is king. From the ancient seams of the mountains there pours forth a vast volume of fuel which lights the furnaces of thousands of factories. Drawing raw materials—iron ore chiefly—from the western districts, and provided with a convenient outlet for manufactured products to the east, this busy territory sets the pace for all other American industrial life.

I. BOUNDARIES AND AREA:
A. **The Hudson River forms the northeastern boundary of the southern Appalachians. Proceeding further toward the south, the region takes in all of New York State, except a thin strip along Lake Erie and Lake Ontario and a narrow border east of the Hudson; northern New Jersey; all of Pennsylvania excepting the Atlantic and Lakes ports; the eastern mountainous parts of Ohio, Kentucky, and Tennessee; all of West Virginia; the western portions of Maryland, Virginia, North Carolina, and South Carolina; and the northern sections of Georgia and Alabama.**
B. **Included in this region are all the southern ridges of the Appalachian Mountains proper, the Piedmont Plateau, the Cumberland Plateau, the Allegheny Plateau, and other regions composing the western Appalachian Highlands. The Adirondacks, although they are geologically part of the Laurentian Plateau to the north, are included because their industrial life focuses southward rather than toward the St. Lawrence River Valley.**

II. PHYSIOGRAPHY: The geological formation of the entire Appalachian region is fully reviewed in the Outline on North America on page 3870. Here we shall emphasize merely some of the more important details peculiar to this southern portion.
A. Important Mountains: **158, 3720, 2517.**
a. **Allegheny Mountains 2160, 3720; Blue Ridge Mountains 70, 2160, 3647; Cumberland Mountains 1916, 3465; Great Smoky Mountains 3465; Lookout Mountain Ridge 70.**
b. **Character of the Mountains: 158, 2717, 3720.**
c. **How Catskills are a Part of the Appalachians: 1692.**
d. **Adirondacks: 25. Classed by Geologists as part of the Laurentian System: 25, 3870.**
B. Plateaus: Piedmont **70, 1431, 2518, 3290, 3720, 3647;** Cumberland **70, 3720;** Allegheny **2718, 2567, 3465.**
C. Rivers.
a. **Geologic History; 158, 1916, 1692.**
b. **Large Rivers**—Hudson River 1692, 2481 (picture); Ohio River 2568, 2572–3, 3720; Susquehanna 2721; Delaware 2721; Potomac 3641; James 3648; Roanoke 3648; Savannah 3290.
c. **Gaps:** These gaps in the mountains, caused by eastward-flowing rivers, were and are of great importance to the transportation of goods and settling of land. 3581.
—Hudson-Mohawk Gap 2484; Delaware Water Gap 2718; Cumberland Gap 1916.
D. Lakes:
a. **Lakes Due to Action of Ancient Glaciers: 1957, 1721, 2516.**
b. **Few Lakes in South:** This is due to fact that ice cap which projected southward during the Ice Age did not reach below the Ohio River: 3872.
E. Soil:
a. **Glacial Soils: 2485, 2571.**
b. **Residual Soils:** In Valleys 2518, 3648, 2457; Plateaus 2160, 1431, 3290; On Rocky Highlands 2518, 3648, 3650.

III. CLIMATE: The great variety of climate is due to varying altitudes and the enormous north-and-south extent of this region: 72, 3290, 3720.

IV. NATURAL RESOURCES:
A. **Minerals: 3590.**
a. **This Section Noted for Rich Mineral Supply:** Coal Most Important 812, 70, 1919, 3650, 3722, 2570, 1432, 2162; Oil 2720, 2570, 1919, 3723; Gas 2570, 1919, 70, 3723: Mineral Springs 3720, 3648, 3466; Salt 3723.

b. **Metals:** Iron 1919, 70, 3650, 1432; Gold 1432, 2520; Bauxite 1432.
c. **Stone:** Granite 3292; Limestone 2720, 1919, 70.

B. **Forests: 2572, 72, 2721, 1431, 2518, 1919, 3291, 3650, 3720.**
—Government Conservation: 2721.

C. **Water Power: 2482, 3466, 1431, 2519, 3290, 2160.**
—Future Water Power in Muscle Shoals: 72.

D. **Good Soil: 2485, 2721, 2570.**

V. CHIEF INDUSTRIES:

A. Mining:
a. **Coal: 2710** (Pennsylvania mines one half of United States supply), **3722, 1919.**
b. **Iron: 70, 3650.**
c. **Copper: 3468.**
d. **Stone:** Marble 2144, 1432; Granite 1497.

B. Other Mineral Products:
a. **Petroleum and Natural Gas: 2720, 3722.**
b. **Clay: 2570.**

C. Agriculture and Live Stock:
a. **Agricultural Products of this Region are Almost as Important as the Minerals.**
b. **Piedmont Plateau Excellent Farmland: 1431, 2518.**
c. **Crops:** Corn 2518, 3291, 3648; Winter Wheat 2721, 2160; Potatoes 2485, 2721; Hay 2485, 2721; Cotton 2518, 3290; Tobacco 2519, 3509; Vegetables 3291.
d. **Dairy Products: 2485.**
e. **Live Stock: 2721, 3722.**

D. **Forestry Products: Tar, Turpentine, Resin: 72.**

E. Manufacturing:
a. **Iron and Steel: 2720, 70–2, 3650, 2162.**
b. **Textiles: 72, 3291, 2458.**
c. **Lumber and Timber Products: 3468, 2721.**

F. Trade and Transportation:
a. **General Characteristics of Commerce**—Interstate Commerce Very Important: 2485, 2568, 2721.
b. **Commercial Value of Rivers: 2482, 2721.**
—While many of the important streams of this section do not become navigable until they pass into the Atlantic Coastal Plain, they have their navigable headwater at the Fall Line, giving a water outlet there to the vast mercantile traffic of the interior highlands. Here also is created a source of water power which is available equally to the Atlantic Coast industries and those along the borders of the Southern Appalachian Region. Several important water gaps cut through the Appalachian Highlands, leading from the Great Lakes Plains and Central Plains to the Atlantic Coast waterways.
c. **Canals—Their Early Influence on Trade: 2484, 2568.**
1. Important Canals of Today: 2484.
2. Future: 2721.
d. **Railroads: 2479, 2721, 2568, 72, 2162, 2484.**

VI. IMPORTANT CITIES:
—**A Territory of many Cities, Chiefly Mining and Manufacturing Centers:**
Schenectady 3136; Troy 3545; Syracuse 3425; Rochester 3033; Scranton 3153; Harrisburg 1591; Reading 2983; Pittsburgh 2812; Akron 69; Youngstown 3832; Nashville 2398; Atlanta 254; Birmingham 426.

## GULF COASTAL PLAIN

THIS PORTION of the Coastal Plain is not essentially different in a geological sense from the Atlantic Coastal Plain. Its surface, for the most part low and flat, is formed by the accumulated sediment of ages. It is an extremely fertile region, including as it does the lower reaches of the vast Mississippi Valley. The chief point which serves to distinguish it from the Atlantic Coastal Plain is the character of its industrial life. Most of the population is devoted to agriculture. Here we shall find comparatively few large cities, both because the rising coastline has few important natural harbors and because the agricultural pursuits of the inhabitants tend to keep them scattered in small communities rather than concentrated in large groups.

I. BOUNDARIES AND AREA:
—**This division roughly includes that portion of the Coastal Plain bordering on the Gulf of Mexico, the western half of Florida, southern half of Alabama, all of Mississippi, western Tennessee, southwestern Kentucky, the small southeastern tip of Missouri, the southeastern half of Arkansas, a thin southern strip of Oklahoma, all of Louisiana, and the eastern half of Texas.**

II. PHYSIOGRAPHY:

A. General Characteristics of the Surface:
a. **Low and Marshy Where it has Recently Risen from the Sea: 1298, 2261, 3466, 3474.**
b. **Character of the Alluvial Land: 2068.**

B. Rivers:
   a. **Mississippi River:** Its early importance 2268; effect of railroads 2268; effect of floods 2262.
   b. **Mobile River 72; Louisiana Rivers 2068; Florida Rivers 1295.**

C. Coastline:
   a. **Mississippi River Delta: 2791.**
   b. **Shallow Inlets Caused by Rising Land: 3474, 2261.**
      —All Texas harbors have to be dredged: 3474.

D. Soil: Much of the soil is good for Fruit Raising because it is light and sandy 70, 1298; or very fertile because of alluvial deposits or vegetable mold 72, 2261, 3465, 2198, 2068, 3474, 1916.

III. CLIMATE:
   A. **Hot Summers and Mild Winters: 2261, 1917.**
   B. **High Winter Temperatures: 1295, 72, 3473.**
   C. **Influence of Winds from the Gulf:** Warm damp winds bring heavy rainfall 72, 2262, 3473; Tropical Storms 1392.

IV. NATURAL RESOURCES:
   A. **Good Farm Lands:**
   B. **Forest: 1297, 72, 3468, 207, 3473.** Yellow Pine, Cypress, and Oak most important.
   C. **Fish: 1297–8, 2264, 2070.**
   D. **Oil and Gas: 2070, 3473.**
   E. **Minerals:** Phosphate 1296; Sulphur 2070; Salt 2070, 3474.

V. INDUSTRIES:
   A. Agriculture:
      a. **Cotton the Chief Product of this Region:**
         1. Texas the leading Cotton State: 3473.
         2. Mississippi (2262) and Alabama (72) next in importance.
      b. **Texas Leads this Section in Corn: 3473.**
      c. **Louisiana Leads in Rice and Sugar Cane: 2068.**
      d. **Florida and Mississippi Send Fruits to the Northern Markets: 1379, 2262.**
   B. **Petroleum: 2070, 3473.**
   C. **Fish: 1297–8, 2264, 2070.**
      —Oysters, Shrimps, and Terrapins are among the characteristic products of the fisheries.
   D. **Stock Raising: 3473, 2262.**
   E. **Manufacturing:**
      a. **Lumber the Most Important Product:**
         —Louisiana is next to the state of Washington in output 2071; Arkansas has some of the largest saw-mills 207; Texas (3473) and Florida (1297) are important for Yellow Pine.
      b. **Manufacturing in New Orleans: 2469.**
         —Good Shipping Facilities and nearness to Natural Gas and Oil. Ship Building.
      c. **Arkansas has the Largest Car Factory in World: 207.**
   F. Trade and Transportation:
      a. **Commercial Centers:** New Orleans 2468–71; Mobile 2274; Galveston 1392.
      b. **Trade:** Early history 2071, 2268; foreign trade (note the advantages of the Panama Canal to this region) 2274.
         —Importance of being near to South America: 2274.
      c. **Transportation:** Early importance of river transportation 2071, 2268; railroads 72, 2198, 2071, 2468, 2274; shipping 2469.

VI. IMPORTANT CITIES:
   A. **Seaports:** Mobile 2274; New Orleans 2468–71; Key West 1921; Tampa 1300; Galveston 1392.
   B. **Inland Cities:** Memphis 2198, 3466 (picture); Dallas 953–4; San Antonio 3121; Houston 1688.

## CENTRAL PLAINS AND INTERIOR HIGHLANDS

THIS is the great farming region of the United States and one of the greatest food-producing districts in the world. The vast stretch of gently sloping land which forms the upper Mississippi Valley, the lower Ohio Valley, and the Great Lakes Plain has a gently sloping surface composed chiefly of exceedingly fertile alluvial and glacial soils. Abundant rains and a warm summer climate round out the requirements for successful agriculture. But this is not all. The region possesses extensive waterways, water power, coal, oil, natural gas, and other great mineral resources which have helped to turn many of its sections into great industrial districts—among the richest and busiest in the nation.

I. BOUNDARIES AND AREA:
   A. **This region is bounded on the north by the Great Lakes and the Canadian border, on the east by the Appalachian Highlands, and on the south by the Gulf Coastal Plain. The boundary between the Central Plains and the Great Plains on the west follows a line running approximately straight from the Lake of the Woods on the Canadian border to the southwestern tip of the Ozark Plateau.** **See map, page 3876.**
   B. **Included in this region are the parts of New York and Pennsylvania which border on the Great Lakes, the western parts of Ohio, Kentucky, and Tennessee; all of Indiana, Illinois, Michigan, Wisconsin, Iowa,**

and Missouri; all but the northwest corner of Minnesota; eastern strips of South Dakota and Nebraska; the eastern half of Kansas; northwestern Arkansas; and northeastern Oklahoma.

C. The Interior Highlands consist of the Ozark Plateau in the south and the spur of the Laurentian Plateau in the north. These highlands are treated with the Central Plains because of their close geographical and industrial relations with this great region.

II. PHYSIOGRAPHY:

A. General Character of the Surface:

a. Rolling Level Plains: **1757, 1730, 1909, 3466, 1803, 1916.**

b. Interior Highlands:

1. Ozark Plateau and Mountains: 2269, 2616.
2. Laurentian Plateau: 1970.

—Highlands in Michigan (2223), Wisconsin (3768), and Minnesota (2254) are part of the Laurentian Plateau.

c. Geologic History of Region:

—Interior sea 2516; erosion of ancient mountains 2252; influence of the Ice Age 1720, 2253, 2571.

B. Rivers and Lakes:

a. Chief Rivers: **Mississippi 2265; Ohio 2572; Missouri 2273.**

b. Lakes: Great Lakes 1510; Lake Superior 3397; Lake Michigan 2227; Lake Huron 1704; Lake Erie 1174.

C. Soil Formation:

a. Glacial Soils: **1757, 2571, 2253.**

b. Alluvial Soils: **2269, 1916.**

III. CLIMATE:

A. Interior Continental Climate with Extremes of Temperature: **3587, 1806, 2269, 1909.**

—Influence of the Great Lakes 1510; Influence of the Ozarks 2269.

B. Rainfall Plentiful: **1909, 2270, 1806, 2253, 1758.**

C. Other Features of Climate: Prevailing Winds 1510; Cyclones 2270; Winter Ice on the Mississippi 2270; Storms and Ice on the Great Lakes.

IV. NATURAL RESOURCES:

A. Rich Agricultural Land Most Important Resource: **2270, 2223, 1731, 1917, 3466, 1803, 1909, 1757, 3294.**

B. Minerals:

a. Coal **811, 813 (picture), 1732, 1760;** Oil and Gas **1911, 2570, 2576, 1760.**

b. Metals: These are found chiefly in the Interior Highlands.

1. Iron: The Mesabi Range is the world's greatest iron-mining center 1816 (picture), 1817; other Iron fields 2223.
2. Copper 881, 2223; Lead 1974, 3771; Zinc 3839, 3771; Aluminum 104, 207.

c. Other Minerals: Stone and Clay 2010, 2254, 2570, 1497, 3771; Diamonds 1001, 207; Mineral Springs 207, 3771.

C. Waterways: **1511, 2568, 2223, 1730.**

D. Water Power: 3770, 2226; Niagara Falls 3695 (picture), 2482 (picture), 2485; Keokuk Dam 1804, 1806; Falls of St. Anthony 2265.

E. Forests: 2224, 3770, 2256, 2270.

F. Fish: 1512, 3771.

V. INDUSTRIES:

A. Farming is the Chief Industry:

a. Corn the Leading Crop: **1803, 1732, 2270, 2430, 1758, 2253, 3770.**

b. Wheat Second in Importance: **1909, 2270, 2430, 2253.**

c. Other Important Crops: Potatoes 2224, 3770; Tobacco 3508, 1917; Hay 1732, 2254, 3770, 3468; Hemp 1917 (picture); Flax 2254, 3770; Sugar Beets 2224.

d. Fruit Thrives on Lake Shores: **2224, 2486.**

B. Dairying: **3770;** Stock Raising: **1803, 1730, 2254, 1758, 2224, 1917, 2571.**

C. Mining: Details of the mining in this region will be found through the same page references that were given under "Natural Resources—Minerals."

D. Manufacturing: The combination of vast natural resources with easy methods of transportation and ready markets make this region particularly favorable for large manufacturing industries.

a. Metal Products:

1. Iron and Steel: Indiana and Ohio lead in the production of Iron and Steel 1760, 2570.
2. Automobiles: Michigan leads the world in the production of Automobiles 2224.
3. Farm Machinery: 1733.

b. Food Products:

1. Meat Packing: Chicago is the greatest Meat Packing center 2180, 1733; other Meat Packing centers 2272, 2430, 2254.
2. Flour: The largest Flour mills in the United States are in Minneapolis 2252, 1304, 1301 (picture).
3. The North-Central states lead in the Vegetable Canning and Milk Canning industries 633.
4. Other Food Products: Prepared Cereals 2224; Beet Sugar 2224.

c. Oil Refining: **1760, 2576.**

d. **Miscellaneous Manufactures:** Furniture 2224, 1736; Drugs and Chemicals 2226; Leather 3770, 2226; Portland Cement 1760; Glass 1760, 2570.

**Note:** The manufactured products of this region are so numerous and varied, it is impossible to list them all. In the articles dealing with the principal cities which are listed at the end of this section, you will find these products set forth in detail.

VI. TRANSPORTATION:

A. Water Transportation:

a. **Importance of Lake Shipping: 1512, 1733, 1760, 2223, 3771, 2568.**

1. Chicago is the second most important port in the United States 721.
2. Iron ore from Lake Superior region is shipped over the lakes to ports in Illinois, Indiana, Ohio, and Pennsylvania 1820.

b. **Importance of River Shipping:** Mississippi 2268; Ohio River 2568, 1919 (picture); Missouri 2273.

c. **Principal Canals:** "Soo" 1513, 627; Welland 3716; Chicago Drainage Canal 724, Erie 627.

B. Railroads:

—Chief Railway Centers: Chicago 721; St. Louis 3109; Kansas City 1912.

VII. CHIEF CITIES:

—The largest cities of this region were founded at places which, in the early days, were natural points for loading and unloading water freight. When the railroads were built these sites became important terminals and transshipping points.

A. **Lake Ports:** Chicago 721; Gary 1401; Duluth 1047; Detroit 1000; Buffalo 527; Cleveland 792; Toledo 3511; Milwaukee 2246; Grand Rapids 1497.

B. **River Ports:** Cincinnati 766; Dayton 970; Louisville 2073; Minneapolis 2252; St. Paul 3111; St. Louis 3109; Kansas City 1912; Omaha 2581.

C. **Other Important Cities:** Springfield 3331; Indianapolis 1762; Columbus 849; Oklahoma City 2577.

## GREAT PLAINS

BETWEEN the Central Plains and the Rocky Mountains and stretching from Canada to Mexico lies that broad belt of almost treeless grassland which we call the Great Plains. Broken here and there by river valleys or by sudden outcroppings of bare and rugged rock, this region is for the most part flat or very gently undulating. Here in the early days roamed the vast herds of buffalo, hunted by the scattered tribes of nomad Indians. As the buffalo disappeared the half-wild cattle of the pioneer ranchmen took their place. Even today most of this semi-arid land is given over to stock raising. But, bit by bit, the wilderness is being brought under cultivation, either with the aid of irrigation or through the special methods of "dry-farming." Coal in great quantities has been found, and oil fields have been discovered. Farms and factories are gradually taking possession of this vast empire.

I. BOUNDARIES AND AREA:

A. **The Great Plains are bounded on the east by the Central Plains, on the southeast by the Gulf Coastal Plain, on the west by the Rocky Mountains, and on the southwest by the Western Plateaus. North to south, the Great Plains stretch from the Canadian border to Mexico.**

B. **This region includes the northwest corner of Minnesota, all of North Dakota, eastern Montana, central and western South Dakota, northeastern Wyoming, central and western Nebraska, eastern Colorado, western Kansas, the northwest tip of Oklahoma, an eastern strip of New Mexico, and central and northern Texas.**

II. PHYSIOGRAPHY: **2790.**

A. Character of the Surface:

a. **Treeless Prairies: 3581, 2522, 2429, 3294, 3818.**

b. **Black Hills the Only Important Elevation: 3294.**

c. **Badlands: 2522, 3296, 2429.**

d. **Geologic History:** Great Plains were once covered by the sea: 2516.

B. **Chief Rivers:** All the important rivers of this region flow east and southeast. With the exception of the Pecos, the principal streams all form part of the Missouri-Mississippi system.

a. **Missouri River and Its Tributaries: 2273;** Kansas River 1910 (map); Platte 2430; Niobrara 2429; Yellowstone 3830.

b. **Tributaries of the Mississippi:** Arkansas 208; Red River 2576.

—The Pecos River (3476) flows into the Rio Grande.

C. **Character of the Soil:** Rich sedimentary soil for the most part, very sandy and rocky in places: 2429, 2430, 3473, 2524.

III. CLIMATE:

A. **Climate of Continental Type: 3587, 3822, 2524, 2310, 1909, 2464, 3474.**

a. **Modifying Effect of Black Hills, 3296.**

b. **Dryness of Atmosphere Makes Extremes of Climate Less Severe than in Central Plains.**

B. **Prevailing Westerly Winds: 3588.**

C. **Rainfall Less than 20 Inches a Year:** The semi-aridity of this region is the chief feature which distinguishes it from the Central Plains.

a. High Mountains Cut off Moisture: **2517** (top of page).
b. Rainfall in Various Parts of Region: **2310, 1909, 2429, 2576, 3294, 3822.**

IV. NATURAL RESOURCES:
A. Vast Stretches of Grazing Land: **3582, 2522, 2429.**
B. Fertile Soil Needing Only Irrigation or Special Dry Farming Methods: **840, 2430, 3588.**
C. Mineral Wealth:
a. Extensive Coal Beds: **2522, 2310, 3820, 841.**
b. Rich Oil Fields: **3820, 2310.**
c. Black Hills Produce Gold, Silver, Lead, Tungsten, etc.: **3297.**

V. INDUSTRIES:
A. Stock Raising and Wool Growing the Most Extensive Industry: **2525, 2310, 3820, 2430, 1911, 3473.**
B. Agriculture: Irrigation and Dry Farming are rapidly increasing the agricultural output of the Great Plains 1827, 641, 840, 2429, 2430, 842 (picture), 3820, 1909, 1910 (picture), 2310, 2464 (picture), 2465, 3294, 3476.
—Principal Crops: Sugar Beets 840, 2310, 3820, 2430, 1909; Wheat 2524, 2310, 840, 1909; Potatoes 2525, 2310, 840, 2430; Rye, Oats, and Barley 2524, 2525, 1911; Corn 2525, 840; Flax 2525, 2310; Hay and Alfalfa 2525, 3820, 2465.
C. Mining and Oil Refining: The references given under "Mineral Wealth" describe the mining industry in this region.
D. Other Industries: Smelting and Refining, Meat Packing 840.

VI. CHIEF CITIES: There are few large cities in the Great Plains region. This is due chiefly to the fact that there are not many great manufacturing industries to bring large numbers of people together.
—**Denver 998; Fort Worth 1333; Pueblo 844; Great Falls and Billings 2312; Cheyenne 3820; Casper and Sheridan 3822.**

## ROCKY MOUNTAINS

RISING abruptly from the Great Plains, the Rocky Mountains form a great barrier which comes down from Canada and reaches seven-eighths of the way across the United States toward Mexico. These mountains constitute the most important watershed in North America, giving rise to four of the largest river systems in the United States—the Missouri-Mississippi, the Columbia, the Colorado, and the Rio Grande systems. Vast stores of mineral wealth have been brought to light in these rugged ranges, and many more doubtless await the search of the prospector. In the sheltered valleys agriculture and stock raising flourish, while the swift mountain streams provide a boundless source of water power, little used in the past but which is waiting to turn the wheels of future industries.

I. BOUNDARIES AND AREA:
A. Bounded on one side by the Great Plains and on the other by the Western Plateaus, the Rocky Mountains in the United States vary in width from one hundred to nearly four hundred miles.
B. The Rocky Mountain region includes western Montana, northern Idaho, central and western Wyoming, northeastern Utah, central and western Colorado, except a small pocket on the Utah boundary, and north central New Mexico.

II. PHYSIOGRAPHY:
A. Important Peaks and Ranges: **3036, 842.**
—Canyons 844, 1725.
B. Continental Divide: **3871, 842, 3818.**
C. Chief Rivers Rising in the Rocky Mountains: Missouri 2273; Yellowstone 3830; North and South Platte 1829, 2430, 998; Arkansas 842; Pecos 3476; Rio Grande 3022; Grand 840 (map); Green 3610; Snake 2594; Clark Fork 846.
D. Lakes and Glaciers: **3035, 1465, 1725.**
E. Geologic History of the Rocky Mountains:
a. Fossils Show They Were Once under the Sea: **1334.**
b. They are Young Mountains: **2358, 2517, 158** (picture).
c. Volcanic Formations: **1725.**

III. CLIMATE:
A. Great Variation in Climate Due to Varying Altitudes: **2310, 1725, 3612.**
B. Rainfall Ranges from Less than 10 Inches to More than 30 Inches a Year: **3588.**
C. Atmosphere Dry and Healthful: **3822, 1725, 845.**

IV. NATURAL RESOURCES:
A. Fertile Valleys: **3820, 2310, 1725.**
B. Minerals:
a. Precious Metals: Gold 1479, 841, 2309, 1727; Silver 3243, 1727, 2309; Uranium and Radium 2960, 841.
b. Other Metals: Copper 882, 2309, 841; Iron 841, 3820; Lead and Zinc 841, 1727, 2309, 2310.
c. Coal: **841, 2309, 1727, 3820.**
d. Precious Stones: **2310, 2466.**
e. Mineral Springs: **1725, 3818, 845.**

C. **Forests: 3035, 2310, 1727, 2466.**
D. **Water Power: 2310, 1725.**
E. **Beautiful Scenery Preserved in National Parks:** Yellowstone Park 3829; Glacier National Park 1466; Rocky Mountain Park 2400; Mesa Verde Park 794 (picture), 844 (text and picture).

V. INDUSTRIES:
A. **Mining:** The references under "Minerals" tell also the story of mining in this region.
B. **Agriculture:**
a. **Field Crops:** Wheat 2310, 1727, 840, 3820; Hay and Alfalfa 1727, 3820, 2310; Potatoes 840, 2310, 3820, 1727; Oats 1727, 840, 3820.
b. **Fruit: 1727, 2310, 840.**
c. **Irrigation Development: 3820.**
C. **Stock Raising: 3820, 1725.**
D. **Lumbering: 2310, 1727, 2466.**
E. **Manufacturing:** The important manufacturing enterprises in the Rocky Mountain Region are mostly all connected with the metal industries. Gold and Copper Smelting are the chief examples 2309, 841.

VI. CHIEF CITIES:
—Butte and Helena 2309, 2312; Colorado Springs 842; Laramie 3822. Both Denver (998) and Cheyenne (3820) are situated on the borderline between the Rocky Mountains and the Great Plains and derive their prosperity from each of these regions.

## WESTERN PLATEAUS

BETWEEN the Rocky Mountains and the Pacific Coast Ranges lies a great stretch of broken land, the greater part of which has less than 10 inches of rain a year. The mountains, which almost completely encircle this region, rob the winds of their moisture before they reach this island area, and the summer heat is such that what little rain or underground water finds its way to the surface is rapidly evaporated and blown away. The result is that there are many real deserts in this region. The soil, however, is extraordinarily fertile, and in those districts where irrigation is possible or where the rainfall is somewhat above the average, tremendous crops can be grown. While consisting for the most part of high plateaus, this section of the United States contains also deep basins, in one case—Death Valley—actually reaching below sea level.

I. BOUNDARIES AND AREA:
A. **Stretching from the Mexican border to within less than a hundred miles from the boundary of Canada, the Western Plateaus are in some places as much as 600 miles wide.**
B. **This region includes southeastern Washington, eastern Oregon, southern Idaho, central and eastern Nevada, western and southern Utah, a small area of southwestern Colorado, all of Arizona, a portion of southeastern California, western and southern New Mexico, and the western corner of Texas.**

II. PHYSIOGRAPHY:
A. **General Character of the Surface: 3580.**
a. **Chief Plateaus:** Columbia Plateau in the north and Colorado Plateau to the southeast 3580.
b. **Grand Canyon Cuts through Colorado Plateau: 1495.**
c. **Great Basin:** Lies between the Columbia Plateau, the Colorado Plateau, and the eastern foothills of the Sierra Nevada 3580.
d. **Chief Deserts are Situated in Great Basin:** Great Salt Lake Desert, Black Rock Desert, Mohave Desert, Colorado Desert, Sonoran or Gila Desert 3580; Painted Desert 200; Death Valley 577.
e. **Small Ranges and Isolated Mountains: 200, 2444.**
—The northern spur of the Western Sierra Madres thrusts up from Mexico into Arizona.
f. **Other Physical Features:** Extinct volcanoes and lava formations 200, 1725, 3580.
B. **Rivers and Lakes:** The only important rivers in this region are those which rise in the Rocky Mountains and attain sufficient volume to flow across the arid areas without drying up. The other streams either drain into salt or brackish lakes or disappear quickly in the dry soil 2444.
a. **Rivers which Cross the Basin and Plateaus:** Columbia 845, 2594; Snake 1726, 2594; Colorado 845; Rio Grande 2464, 3022.
b. **Lakes Fed by Interior Drainage:** Great Salt Lake 1515; Humboldt Lake 2445 (map).

III. CLIMATE:
A. **Extremes of Temperature Due to Varying Altitudes and Lack of Tempering Moisture: 199, 2444, 3612, 3686, 2594, 1725.**
B. **Scanty Rainfall: 200, 2444, 1725, 577, 3580.**
C. **Dryness of Atmosphere Makes Climate Healthful: 200, 3612.**

IV. NATURAL RESOURCES:
A. **Minerals are Chief Resource:** Copper, Gold, Silver, and Lead 202, 2444, 2445, 3610, 2466; Nickel, Mercury, Sulphur, and Borax 2445; Salt 2445, 3612; Coal 202, 3612; Zinc 3610; Iron 3612; Building Stone 2445, 3612.
B. **Fertile Soil: 202, 2444, 3610; Forests: 202, 2444.**

V. INDUSTRIES:
A. **Mining and Quarrying:** These are the leading industries of this region. They are described under the references given for "Minerals."

B. **Stock Raising: 202, 2444, 3610, 3687, 2594, 1727.**

C. **Agriculture:** The important farming districts are situated for the most part near the boundaries of the Basin and Plateaus, where water is available for irrigation, or where there is sufficient rain to make possible dry farming methods. While the amount of agricultural land is comparatively small, the yields per acre are enormous.

a. **Chief Crops:** Wheat 3588, 202, 2444, 3610, 3687, 2594, 1726; Barley 202, 2444, 3687, 2594; Oats 3687, 1726; Hay and Alfalfa 202, 2444, 3610, 3687, 2594, 1726; Sugar Beets 202, 3610; Fruits 2444, 3610, 3687; Egyptian Cotton 202, 1830.

b. **Irrigation: 1827, 202, 2444, 3610, 1726, 2465.**
—Roosevelt Dam 1830 (picture); Elephant Butte Dam 2464 (picture); Truckee-Carson System 1829 (picture).

D. **Manufacturing:** With the exception of Smelting, there are few important manufacturing industries in this region 202, 2445.

VI. CHIEF CITIES:
—**Salt Lake City 3116; Spokane 3328; Albuquerque and Santa Fe 2466; Tucson 202; Ogden 3612; Boise 1729.**

## PACIFIC RANGES AND LOWLANDS

NOWHERE in the world is the effect of mountains on climate and the effect of climate upon life better demonstrated than in crossing the great ranges which separate the Western Plateaus and the Great Basin from the Pacific slopes of the United States. On the one side is an arid parched region subject to violent changes of temperature, and, except in small favored localities, bare of useful vegetation, thinly populated, and with few industries. On the other side is a paradise with ample rainfall, equable temperature, luxuriant vegetation, flourishing fields, great cities, and thriving industries. The secret of this tremendous contrast lies in the fact that when the warm moisture-laden winds from the Pacific strike the mountain ranges, they are cooled and release their moisture in the form of rain or mountain snows. The vast Pacific Ocean does not vary much in temperature the year around, so that it remains warmer than the atmosphere in the winter and cooler than the atmosphere in the summer. Thus it prevents extreme variations in temperature along the coast.

I. BOUNDARIES AND AREA:

A. **The Pacific Ranges merge with the Rocky Mountains near the Canadian border. Extending southward they reach their greatest width midway down the coast of the United States, where they are about 250 miles across. At the Mexican border, they merge with the highlands of Lower California.**

B. **This region includes northern and western Washington, western Oregon, some portions of western Nevada, and all of California, except the southeastern corner.**

II. PHYSIOGRAPHY:

A. **Mountain Ranges:**

a. **Sierra Nevada 3231, 576, 2444, 3580; Cascade Range 3686, 2594, 3580; Coast Ranges 3686, 2594, 576, 3580.**

b. **Lesser Ranges and Peaks:** Olympic Mountains 3686, 3580; Mount Whitney 576, 584 (picture); Mount Shasta 3231, 3580; Lassen Peak 3231; Mount Rainier, Mount Baker, Glacier Peak, Mount Adams, Mount St. Helens 3687.

c. **Geologic History:** Form part of young Cordillera Mountains 2517; volcanic formations 3658, 3231; formation of Sierra Nevada and Great Basin 1064.

B. **Chief Valleys:** Puget Trough between Cascades and Coast Range 3581; Great Valley of California between Sierra Nevada and Coast Range 3581, 576, 581.

C. **Chief Rivers:** Columbia 845, 3687, 2594; Willamette 2594; Sacramento and San Joaquin 578, 581.

D. **Coastline:** Because this part of the United States rose from the sea at a comparatively recent geologic period, the coastline is for the most part unbroken and there has not been time for the formation of a coastal plain, such as exists on the Atlantic side. In the north, the coast has sunk again, producing Puget Sound (3687), but southward the coast is still rising, and the only natural harbors are found where the Sacramento-San Joaquin Rivers have cut through the Golden Gate to form San Francisco Bay and where the ocean currents have cut out and built up San Diego Bay (2517).

III. CLIMATE:
—The chief features of the climate of this region are briefly discussed in the opening paragraph of this section.

A. **Mild Equable Temperature: 3686, 2594, 581.**
—**Prevailing Westerly Winds 3588.**

B. **Rainfall Heavy in the North, Diminishing toward the South, 3686, 577, 3588, 2594.**

IV. NATURAL RESOURCES:

A. **Forests of Tremendously Valuable Timber: 1327, 3687, 2594, 581.**

B. **Minerals:**

a. **Gold, Silver, Copper, Iron, Lead 578, 3688, 2596; Mercury or Quicksilver 578, 582.**

b. **Oil 578; Coal 3688, 2596; Graphite 578.**

c. **Building Stone: 3688, 2596, 578.**

C. **Water Power: 3688, 578.**

D. **Fish:** Salmon 3687–8, 3113; Sturgeon 2596.

E. **Soil:** Very Fertile in Valleys 2596, 578.
F. **Beautiful Scenery Preserved in National Parks:** Yosemite 3831; Mount Rainier National Park 3687; Sequoia National Park 2399–2400.

V. INDUSTRIES:
A. **Agriculture:**
a. **Field Crops:** Wheat, Barley, Alfalfa, Potatoes 578; Rice 582; Sugar Beets 581.
b. **Fruit:** This is the leading fruit producing region of the United States 1379.
1. Oranges 2588; Lemons 1985; Grapes 1501; Apples 161.
2. Other Fruits: 2596, 3687, 582.
c. **Olives and Nuts: 2579, 582.**
B. **Lumbering and Lumber Products: 3688, 2594, 577, 580.**
C. **Manufacturing:**
a. **Food Products:** Fish Canning 2596; Fruit and Vegetable Canning 580; Flour 3688, 580; Sugar 580; Honey 578; Dried Fruits 582.
b. **Iron and Steel Products: 3688.**
D. **Mining and Quarrying:** Consult the same references as given under "Minerals."
E. **Motion Picture Industry:** 578, 2344.
F. **Other Industries:** Oil Refining, Meat Packing 580; Ostrich Farming 578, 2603; Ship Building 3688, 580.
G. **Transportation:** Shipping centers of the coast carry on trade with Orient 3124, 3169; five transcontinental railroad lines in California 580.

VI. CHIEF CITIES:
—**San Francisco 3124; Seattle 3169; Los Angeles 2062; Portland 2885; Tacoma 3427; San Diego 3123; Sacramento 3103.**

## POSSESSIONS OF THE UNITED STATES

THE United States has few colonies or outlying possessions. This is due to the fact that it is the youngest among the great nations of the world, having never suffered from that overcrowding and fierce trade competition which led the nations of Europe to seek foreign territory and the control of distant markets. Much of the earth's surface had been subdivided by European powers before the United States came into existence, and later, when the rush opened for colonies in Africa and in the Pacific, the United States was busy settling and developing its own vast territory. The policy of the government has been generally opposed to acquiring foreign possessions.

I. ALASKA: **74.**
A. **Boundaries and Area:** Alaska is bounded on the north by the Arctic Ocean (189–90), on the west by Bering Sea (384), on the south by the Pacific Ocean, and on the east by Canada. Area, 590,884 square miles, making Alaska more than twice as big as the state of Texas.
B. **Physiography and Climate: 76–7.**
—Mt. McKinley (2103) is the highest mountain in North America; the Yukon River (3835) with its tributaries provide 3,500 miles of navigable waters.
C. **Industries:**
a. **Mining:** Gold 1479, 3836; Copper 882; Tin 3504; Coal 74.
b. **Fisheries:** 1280, 3113.
c. **Fur Industry:** Seal fur most important 3167–8.
d. **Reindeer Raising: 2993.**

II. ISLAND POSSESSIONS:
A. **In the Atlantic:** For the physiography, climate, and other general characteristics of these islands consult the Outline on the West Indies.
a. **Porto Rico: 2885, 3586.**
b. **Virgin Islands: 3651, 3586.**
B. **In the Pacific:** Read the article on the Pacific Ocean (2617) for the general geographic background.
a. **Hawaiian Islands: 1601.**
b. **Eastern Samoan Islands: 3120; Guam 1545.**
c. **Philippine Islands: 2764.**
—See also general article on East Indies (1070) and Manila (2136).

III. PANAMA CANAL ZONE: **2648–9, 2651, 3586, 2662** (map). Apart from its commercial and military importance, the Panama Canal Zone is interesting to the student of Geography because of many peculiar conditions. Under treaty with the Republic of Panama, the United States controls the strip of land in which the canal is built; but since this strip contains the city of Panama, the capital of the Republic, as well as the city of Colon, it has been necessary to leave those portions of land on which these cities stand outside the jurisdiction of the United States. Another interesting feature is the twist in the Isthmus which makes the Atlantic mouth of the Canal actually further *west* than the Pacific mouth (2662).

# CANADA

THE British Dominion of Canada, with an area larger than the United States including Alaska, is a much younger country from the point of view of development. The commercial centers on the Atlantic and Pacific coasts, and along the great interior waterways of Canada, present a picture of thriving industry which rivals the prosperity of its sister nation to the south. But in the interior of the Dominion and in the north are vast stretches of wilderness still beckoning to the pioneer and settler. Although the eastern districts of Canada and of the United States were explored and settled at about the same time, Canada did not get started on the road to organized agricultural and industrial development as soon as the United States. This was due to two principal factors: first, the more severe winter climate of Canada which discouraged the pioneer farmer from venturing far from the valley of the St. Lawrence or the tempered regions bordering the Great Lakes; and second, the fact that Canada acquired self-government almost a century later than the United States, lacking meanwhile that coöperation between the provinces and definite home organization so necessary for carrying on great self-supporting enterprises. Since the establishment of the Dominion Government, however, great strides have been made. Except in the extreme north, where the arctic climate makes agriculture impossible, the land is rapidly being brought under the plow. With tremendous natural resources in fertile soil, waterways, water power, forests, minerals, and fisheries, Canada is every year taking a more and more important place in the commerce of the world.

I. BOUNDARIES AND DIVISIONS:

A. **Boundaries:** Canada is bounded on the east by the Atlantic Ocean and Baffin Bay, on the north by the Arctic Ocean, on the west by Alaska and the Pacific Ocean, and on the south by the United States. This latter boundary, beginning on the Pacific side, passes south of Vancouver Island through the Strait of Juan de Fuca, thence north to the parallel of latitude 49°, and follows this parallel eastward to the Lake of the Woods. From here it follows a chain of small rivers and lakes to the mouth of the Pigeon River at Lake Superior, crosses this lake, going north of Isle Royal, passes through St. Mary's River, down through Lake Huron, through the St. Clair River, Lake St. Clair, and the Detroit River to Lake Erie, up across Lake Erie, through the Niagara River, across Lake Ontario, and through the St. Lawrence to a point near latitude 45°, thence straight east to the boundary of Maine, and follows the irregular line of this boundary to the Atlantic, emerging at the mouth of the St. Croix River, on the Bay of Fundy.

B. **Political Divisions:**

a. **Maritime Provinces: Nova Scotia 2537; Prince Edward Island 2915; New Brunswick 2449.**

b. **Eastern Provinces: Quebec 2945; Ontario 2582.**

c. **Prairie Provinces: Manitoba 2136; Saskatchewan 3128; Alberta 82.**

d. **Western Province: British Columbia 510.**

e. **Territories: Yukon Territory 3836; Northwest Territories 2528.**

—The Northwest Territories are composed of three Provisional Districts, Keewatin, Mackenzie, and Franklin.

**Note:** Newfoundland is not a part of the Dominion of Canada but forms an independent British colony. It includes, under its jurisdiction, a narrow strip along the eastern coast of Labrador.

II. PHYSIOGRAPHY: The general physiography of the northern part of North America is described in the Outline on pages 3869 to 3873. Here we shall review only those details peculiar to the Canadian region.

A. **Mountains and Plateaus:**

a. **Appalachian Highlands Extend Northward from United States into Maritime Provinces of Canada: 158.**

b. **Laurentian Plateau is Oldest Land Formation in North America: 1970.**

—Covers more than half of Canada: 1970, 602.

c. **Ranges of the Cordillera System in the West:**

—The Canadian Rocky Mountains (3035) and the Coast Ranges (512) inclose a great valley and plateau, which runs parallel with the Pacific coast from the United States boundary to Alaska.

B. **Plains:**

a. **Central Plains of United States Extend over to Tongue of Land between Lakes Huron, Erie, and Ontario: 2582 (see also map of Canada).**

b. **Great Plains Lying Between Laurentian Plateau and Rocky Mountains: 602.**

1. Great Plains include southwestern Manitoba (2136), central and southern Saskatchewan (3128), all of Alberta except a southwestern strip (82), a western strip through the Provisional District of Mackenzie (2528).
2. Plains were once bed of sea (2516) and later bed of great inland lake (2136, 2790).
3. In the extreme north, the Great Plains merge with the Laurentian Plateau to form Barren Lands and Tundras: 603, 2515.

C. **Rivers and Lakes:**

a. **St. Lawrence River Flowing between Appalachian Highlands and Laurentian Plateau: 3107.**

b. **Nelson-Saskatchewan River System Flowing from Rocky Mountains across Great Plains and Laurentian Plateau to Hudson Bay: 604, 3129.**

—Red River of the North: 2986.

c. Mackenzie-Athabaska River System Flowing from the Rocky Mountains and the Laurentian Plateau Northward through the Great Plains to the Arctic Ocean: **604, 2102, 82.**
—Peace River: 2698.
d. Yukon River Flowing Northward between the Rocky Mountains and the Coast Ranges and Crossing into Alaska: **3835, 604.**
e. Fraser River Flowing Southward between the Mountains and Emptying into Queen Charlotte Sound: **512.**
f. Great Lakes: **1510.**
g. Other Large Lakes: Lake Winnipeg 2136; Great Slave Lake and Great Bear Lake 2102.

D. Coastline:
a. Deep Fiords and Bays on Coasts of Labrador and British Columbia: **1948, 510.**
—Caused by sinking of the northern half of North America: 2517.
b. Hudson Bay and Northern Island Groups: **1690, 189.**
—The Magnetic Pole is situated in the southern part of this island group near parallel of latitude 70°: 1064.

E. Important Islands: Cape Breton Island 639; Vancouver Island 3617.

III. CLIMATE:

A. Prevailing Climate is of the "Continental" Type: **606, 794.**
a. Great Variation in Temperature: **2136, 512.**
b. Extremes of Heat and Cold Tempered by Dryness of Atmosphere: **606, 3128, 2946.**
c. Effect of the Chinook Winds: **3751, 82, 2698, 512, 3128.**
d. Influence of Great Lakes: **1510, 2582.**

B. Climate of the Atlantic Seaboard:
a. Maritime Provinces Have Comparatively Mild Climate: **2915, 2538.**
b. Harbors Free from Ice in Winter: **2449.**

C. Climate of the Pacific Coast:
—Warm Winds from Ocean Keep Winters Mild: **606, 512.**

D. Climate of the Northern Districts: **2528, 2698, 190.**
a. Hudson Bay Ice-Bound Most of the Year: **1690.**
b. Long Summer Days Help Make up for Shortness of Warm Season: **2699, 3836.**

E. Rainfall: **606.**

IV. NATURAL RESOURCES:

A. Fertile Soil: **602, 2136, 2698, 1970, 2946, 83.**
a. Vast Districts Still Uncultivated: **602, 610, 512.**
b. Good Grazing Land: **512.**

B. Vast Forests of Valuable Timber: **610.** Forests, composed chiefly of evergreen trees, cover almost all of the uncultivated surface of Canada, except the Great Plains and the Arctic Regions.
a. Forests on the Laurentian Plateau: **1970, 2945, 1690, 2583, 2137, 3128.**
b. Forests of the Rocky Mountains and West Coast: **512, 607** (picture).
c. Forests in the Maritime Provinces: **2538, 2449, 606** (picture).

C. Minerals: **610, 1970.**
a. Gold and Silver: **512, 2582, 2583, 3836, 2137, 3242.**
b. Sudbury District of Ontario Produces Most of the World's Nickel: **2507, 610, 2582, 2583** (picture).
c. Most of the World's Asbestos Comes from Quebec: **225, 610, 2945, 2946** (picture).
d. Coal and Petroleum: **610, 640, 512, 82, 2538, 3128, 2583.**
e. Other Minerals: Copper 512, 2137, 2583, 2945, 3836; Iron 610, 512, 2538, 2583, 2945; Zinc and Lead 512, 2583; Cobalt 816, 610; Mica, Molybdenite, and Graphite 2945.

D. Fish: **610, 512, 2137, 1285.**

E. Fur-Bearing Animals: **1389, 603, 2137, 2528, 2583.**

F. Vast Network of Waterways and Unlimited Sources of Water Power: **603-6, 2582, 2947, 512, 3694, 2604, 3835.**
—The Great Lakes and the St. Lawrence River form one of the most important systems of water transportation in the world: 1510, 3107.

G. Beautiful Scenery Preserved in National Parks: **2400.**

V. INDUSTRIES:

A. Agriculture the Most Important Industry: **606, 608, 2136, 82.**
a. Wheat is the Largest Crop: **602, 3128, 2137, 2582, 3732.**
b. Other Crops: Oats 608, 2582, 3128, 2915; Barley 2582, 3128; Rye 3128; Flax 2582, 3128; Hay 2449, 2582; Potatoes 2449, 3128, 2915.
c. Fruit: **608, 512, 2538, 2582, 2946.**
d. Irrigation and Dry Farming: **3128, 82, 512.**

B. Stock Raising, Dairying, and Dairy Products: **608, 2137, 3128, 2449, 2582, 2915, 2946.**

C. Mining: Only a small part of Canada's vast mineral resources have been developed 610; see also references under Minerals.

D. Lumber and Lumber Products: **610, 2945, 2583, 3128, 512, 2538, 2449.**
—Wood Pulp for making Paper (2667) is an important product: 2583, 2449, 640, 2946 (picture).

E. Fisheries: **610, 2538, 2449, 2915, 2137.**
   a. Salmon Canning in British Columbia: **512.**
   b. Canada's Department of Fisheries: **1280.**
F. Fur Industry: **1389.**
   a. The Famous Hudson's Bay Company: **1692.**
   b. Fur-Farming in the Maritime Provinces: **610, 2915, 1389.**
G. Manufacturing: **610.** The most important manufacturing region in Canada is southern Ontario: 2582. For the various products of Canadian factories consult also the city articles listed at the end of this Outline.

VI. TRANSPORTATION:
A. Water Transportation: In addition to the natural waterways referred to under Natural Resources, numerous canals facilitate commerce in the Dominion. Chief among these are the Welland Canal, the Trent Canal, the Rideau-Ottawa Canal system, the Rideau Canal (3716, 627).
B. Importance of Railroads to Development: **608, 2449, 513, 3617.**

VII. CHIEF CITIES:
A. Seaports: **Halifax 1565; Saint John 3107; Vancouver 3617; Victoria 3638.**
B. River Ports: **Montreal 2317; Quebec 2948; Ottawa (capital) 2604.**
C. Lake Ports: **Toronto 3516; Kingston 1926; Hamilton 1569; Fort William 1333.**
D. Interior Cities: **Winnipeg 3752; Regina 2992; London 2057; Edmonton 1084; Calgary 575.**

# Newfoundland and Labrador

ALTHOUGH the island of Newfoundland is closely related in the geographical sense to the Canadian mainland, it has a colonial government entirely independent of the Dominion. It is regarded as the senior colony of the British Empire, the original claims to the island having been based upon the discoveries of John Cabot in 1497. Because of the important position of the Labrador coast in connection with the great fisheries of this region, this coast was placed in 1763 under the Newfoundland governorship. Today, a strip running from Hudson Strait to the Strait of Belle Isle remains a part of this colony.

I. POSITION AND PHYSIOGRAPHY:
A. Newfoundland Occupies Strategic Position at Mouth of Gulf of St. Lawrence: **2450.** It is separated from the northern mainland by Belle Isle Strait, and from Cape Breton Island by Cabot Strait. South of Newfoundland lie the two small islands of St. Pierre and Miquelon which belong to France.
B. Newfoundland is a Rugged Rock-Bound Island: **2450.**
   a. Highlands in the West: These are geologically a continuation of the Appalachian Highlands which run through the Maritime Provinces of Canada.
   b. Soil in the East Deposited by Melting Icebergs: **2450.**
C. Fiords and Bays of Labrador Caused by Sinking Coastline: **2517, 1948.**

II. CLIMATE:
A. Eastern Newfoundland Cold and Foggy: Western Newfoundland Has Milder Climate: **2450, 1316.**
B. Labrador a Lonely Land of Brief Summers and Frigid Winters: **1948.**
   —Effect of the Labrador Current: 1948, 255.

III. NATURAL RESOURCES AND INDUSTRIES:
A. Newfoundland Banks and Labrador Coast Famous for Their Fish: **2450, 1948.**
   a. Cod the Most Important Product of the Fisheries: **1282-4.**
   b. Other Products of Fisheries: Salmon, Seal Oil, Whalebone, Herring 1948.
B. Coal, Petroleum, Copper, Iron, and Timber: **1948, 2450.**
C. Fur Industry in Labrador: **1948.**
D. Some Manufacturing in Newfoundland: Paper and Pulp Mills, Ship-Building 2450.
E. Water-Power at Hamilton Inlet, Labrador: **1948.**

IV. POPULATION:
A. Newfoundland Settled by English, Scotch, and French Fishermen: **2450.**
B. Cree Indians and Eskimos Mingle with White Settlers in Labrador: **1948, 1174.**
C. St. Johns, the Capital of the Colony, is the only Important City: **2450.**

# MEXICO

MEXICO is a land of enormous natural wealth. Almost every resource essential to modern industry exists in profusion. Yet this great land is economically poor. Its resources lie for the most part undeveloped. Agriculture is backward, railroads are comparatively few and often poorly equipped, and internal commerce as well as foreign trade are for the most part unorganized. For the causes of this condition we must look back into history. Mexico was conquered and brought under European influences long before the rest of North America. When the Pilgrims landed at Plymouth Rock, Mexico was already under the dominion of a powerful colonial organization.

But the Spanish conquerors were not trying to create prosperity in Mexico, nor did they work to establish permanent self-supporting settlements, nor to develop agriculture and trade. For them Mexico was simply a great mine of gold and silver, a storehouse of rare woods and spices, to be exploited and drained of its super-

ficial and easily-obtained wealth for the benefit of the royal government and its favored representatives. To carry out this plan of exploitation, the natives were virtually enslaved and set to work for the conquerors. Three hundred years this condition lasted, and when Mexico finally won its independence, it had a population untrained in government or individual industry, and sharply divided into a small educated class and a large ignorant class. The result was political chaos. Revolution followed revolution. Ambitious leaders always found it easy to recruit bands of lawless followers from the uneducated masses. Order prevailed only when some leader more powerful than the rest succeeded in establishing a dictatorship, which drove the peon unwillingly back to his toil.

Today, however, a new era is dawning for Mexico. The national consciousness is aroused to the fact that any sound economic system in that great land can be built only with the aid of an educated public. With the friendly aid of foreign governments, Mexico bids fair to come into its own.

I. BOUNDARIES AND AREA:
- A. **The Rio Grande marks the boundary between the United States and Mexico from the Gulf of Mexico to the westernmost point of Texas. From there the boundary runs westward with a few small breaks, emerging on the Pacific coast a few miles below San Diego Bay. At the other end Mexico borders on Guatemala and British Honduras.**
- B. **The general shape of the country is a rough triangle slanting from northwest to southeast. The southern tip of the triangle curves upward in the Yucatan Peninsula, which forms the Gulf of Campeche, and, with the aid of Florida and Cuba, encloses the Gulf of Mexico. At the other extremity of the triangle, the peninsula of Lower California juts southward into the Pacific, forming the Gulf of California. The Tropic of Cancer cuts Mexico in two.**

II. PHYSIOGRAPHY:
- A. Mountains and Plateaus: The mountains of Mexico form part of the great Cordillera system 2515.
  - a. Divided into Two Principal Ranges:
    1. Sierra Madre Oriental or Eastern Sierra Madre: 2209.
    2. Sierra Madre Occidental or Western Sierra Madre: 2209.
  - b. Central Mexican Plateau or Table Land between the Two Ranges: **2209.** This is part of the great North American Plateau which runs from Alaska south to Mexico City: 2515.
  - c. Cordillera Mountain Chain Broken at Isthmus of Tehuantepec: **2515.**
  - d. Many Active and Extinct Volcanoes: **2515, 2209.**
- B. Coastal Plains:
  - a. Eastern Coastal Plain is an Extension of the Gulf Coastal Plain of the United States: **3581.** This plain broadens out in the south to cover most of the Yucatan Peninsula (3834). The coast is low and has no good natural harbors (2209).
  - b. Western Coastal Plain is Narrow: **2209 (map).** Many fine harbors are found on the west coast (2209).
- C. Two Great Peninsulas: Yucatan **3834;** Lower California **587.**
- D. Rivers: With the exception of the Rio Grande (3022), the rivers of Mexico are of no great size. The mountain ranges are too close to the coasts to allow large streams to form 2208 (table), 2209 (map).

III. CLIMATE:
- A. Temperature Varies Greatly with Altitude: **2210.** Coastal plains exceedingly hot; Central Plateau mild; mountains cold.
- B. Yucatan and Lower California Generally Hot and Dry: **3834, 587.**
- C. Rainfall: Heavy rains in the south, but mountains cut off moisture from interior 2210.

IV. NATURAL RESOURCES:
- A. Rich Soil and Extensive Grazing Lands: **2208, 2212.**
- B. Minerals:
  - a. Anthracite Coal in Sonora: **2208, 2211;** Graphite **2210.**
  - b. Metals: Silver 2208, 2210; Gold, Copper, Lead, Iron, Antimony, Quicksilver, Zinc, Manganese 2210.
  - c. Vast Supplies of Oil: **2211, 2753, 2749** (picture).
- C. Great Forests of Valuable Timber: **2208, 2213–4, 2046.**

V. INDUSTRIES:
- A. Agriculture: The great variety of climate in Mexico makes it possible to raise almost every kind of crop 2208.
  - a. Chief Food Crops: Corn, Wheat, Beans, Sugar Cane, Coffee, Cacao, Fruits, and Spices 2213.
  - b. Fiber Crops: Cotton 2213, 3834; Agave or Sisal Plant 42, 3244, 2214, 3834.
  - c. Other Crops: Tobacco 2213; Guayule Rubber 2212, 3074.
- B. Stock Raising on the Northern Plateaus: **2212.**
- C. Mining is the Principal Industry: Mexico produces one third of the world's Silver, ranks next to the United States in Copper production, and yields important quantities of Lead, Zinc, Antimony, and Graphite. The Coal and Iron deposits have not yet been developed on an important scale. See also references under Minerals above.
- D. Mexico Ranks Next to United States in Oil Production: **2211.**
- E. Manufacturing: Meat Packing, Cotton Milling, Rope and Twine, Soap, Cigars and Cigarettes, Sugar, Rubber 2212–3.

F. **Foreign Trade:** Mexico's foreign trade is mostly with the United States. Exports consist chiefly of Mineral Products, Sisal, Cotton, Tobacco Products, and Cattle.

VI. CHIEF CITIES:
—**Mexico City 2218; Guadalajara 2209 (map); Vera Cruz 3626.**

VII. PEOPLES OF MEXICO:
- A. **Original Inhabitants: Aztecs and Mayas 288, 3834.**
- B. **Invasion by Spaniards in 16th Century: 894.**
- C. **Present Mixed Population of Indian and White Blood: 2208.**

# CENTRAL AMERICA AND WEST INDIES

THE continents of North and South America may be said to be connected by two sets of mountain chains. One of these, which is above sea level throughout its entire length, forms the great isthmus which we call Central America. The other is partially submerged beneath the waters of the ocean, leaving only its loftiest peaks and plateaus exposed. These form the great chain of islands known as the West Indies or Antilles. A glance at the map on page 110 will show you the relationships of these land masses. The Yucatan Peninsula and the Florida Peninsula, which form the Gulf of Mexico, are both continued in that island chain which sweeps eastward and then southward in a giant curve reaching to the coast of Venezuela in South America, and embracing the Caribbean Sea. All of Central America and all of the West Indies, except a few small islands to the north, lie in the Tropical Zone. This circumstance as well as their geological formation gives the two many things in common.

## Central America

I. BOUNDARIES AND AREA: **679, 680 (map).**
- A. **The name Central America is applied to the great isthmus which stretches from the Yucatan Peninsula southeastward to the mainland of South America. Geographically, it is usually considered a part of North America, although its climate, its plant and animal life, and its people have more in common with tropical South America.**
- B. **The total area of Central America is somewhat more than the combined areas of the New England States, New York, New Jersey, Pennsylvania, and Ohio.**

II. PHYSIOGRAPHY AND CLIMATE:
- A. **Backbone of Mountains Belonging to Cordillera Chain: 2515, 679.** Chain broken by lake basin of Nicaragua: 2504.
- B. **A Land of Volcanoes and Earthquakes: 679, 3119, 2504, 1546.**
- C. **Two Contrasting Regions:**
  - a. **Atlantic or Caribbean Coastal Region:** Generally low and swampy, hot, and unhealthful, 679, 1546, 2505.
  - b. **Mountainous Region on Pacific Side:** Temperate and generally healthful, 679, 1547, 2505.

III. PLANT AND ANIMAL LIFE:
- A. **Hot Lowlands:** Dense vegetation, inhabited by countless animals similar to those found in the tropical forests of South America: 680.
- B. **Upland Valleys:** Vegetation more nearly resembling that of the Mexican plateau: 2505, 1676.

IV. PEOPLE OF CENTRAL AMERICA:
- A. **Population Made up of Three Principal Elements:** Spanish, Indian, and Negro. These have largely intermingled, particularly in the more settled regions: 679, 1546, 1676, 3119, 2505, 896.
- B. **People Chiefly Center in Settlements on Pacific Coast Side: 2505, 1676.**

V. PRODUCTS:
- A. **Hot Lowland Region: 680.** Bananas 324, 325 (picture), 896, Mahogany 2124, Logwood 2046, Chicle 719, Guayule Rubber 3074, Coconuts 2649.
- B. **Upland Region: 679.** Coffee 822, 679, Tobacco 2649, Cacao, Corn, Rice, Beans, Sugar 2505, Henequen 1676, Gold and Silver 679, Copper, Iron, and Coal 1676.

VI. TRADE AND TRANSPORTATION:
- A. **Foreign Commerce: 2505, 896, 1546, 1676, 3118.** Trade mostly with United States 680.
- B. **Few Railways, Transportation Mostly by Highways: 679, 896 (picture).**

VII. POLITICAL DIVISIONS:
- A. **Guatemala: 1545.** Area, 48,290 square miles; population, about 2,000,000. Chief cities: Guatemala City (capital); Atlantic Coast port, Puerto Barrios; Pacific Coast port, San Jose.
- B. **Honduras: 1676.** Area, 44,275 square miles; population, about 640,000. Chief cities: Tegucigalpa (capital); Atlantic coast port, Puerto Cortes; Pacific Coast port, Amapala.
- C. **Salvador: 3118.** Area, 13,150 square miles; population, about 1,300,000. Chief cities: San Salvador (capital), Santa Ana; no Atlantic coast line; Pacific Coast ports, Acajutla and La Union.
- D. **Nicaragua: 2504.** Area, 49,200 square miles; population, about 750,000. Chief cities: Managua (capital), Leon, Granada; Atlantic Coast port, Bluefields; Pacific Coast ports, Corinto, San Juan del Sur.
- E. **Costa Rica: 896.** Area, 23,000 square miles; population, about 400,000. Chief cities: San Jose (capital), Cartago; Atlantic Coast port, Limon; Pacific Coast port, Puntarenas.

F. Panama: **2648.** Area, 32,380 square miles; population, about 400,000. Chief cities: Panama (capital and Pacific Coast port); Atlantic Coast port, Colon.

G. Foreign Territory:

a. British Honduras: **1676.** Area, 8,600 square miles; population, about 45,000; capital, Belize.

b. Panama Canal Zone (United States): **2651, 2662** (map).

# West Indies

I. POSITION AND AREA: **3718,** Map next to page **2515.**

A. The West Indies stretch from the entrance to the Gulf of Mexico eastward and southward to the coast of South America, forming the northern and eastern boundary of the Caribbean Sea. With the exception of a part of the Bahamas, they lie entirely within the tropical zone. The Bahamas reach within 60 miles of the Florida coast.

B. The total area of the West Indies, including islets and keys, is approximately 92,000 square miles, about the same as the combined area of Indiana and Illinois.

II. PHYSIOGRAPHY AND CLIMATE:

A. Bahamas Consist of Coral Formations Resting on Submerged Mountains: **3718, 305.**

B. Remainder of West Indies Chiefly of Volcanic Formation: **3718, 2156.**

a. Most of the Islands have Important Mountains, Sometimes Snow-Capped: **936, 1859, 1560, 3125, 2885, 2156, 3541.**

b. Mont Pelée, an Active Volcano: **2156.**

—Earthquakes are frequent: 1859, 1545.

C. Rolling Plains on Some Islands and Low Swampy Coast Lands: **936, 3126, 3541.**

D. Usually Hot and Damp with Abundant Rainfall: **936, 2886, 2156, 1560.**

E. Hurricanes are Frequent: **936, 1859, 1545.**

III. PEOPLE OF THE WEST INDIES:

A. Majority of People of Entire West Indies are Negroes or of Negro Descent, Though Whites Predominate in Some Islands: **3718, 937, 1860, 1561, 3126, 2886, 305, 3651, 329, 3541.**

B. Whites are of Mixed Nationalities in All the Islands, Including Descendants of Early Spanish Conquerors: **3718, 987, 2886.**

C. Negroes are Descendants of Former Slaves: **937, 1860, 1561, 2434.**

D. East Indians and Chinese Introduced as Laborers: **3718, 1860.**

IV. PRODUCTS:

A. Cane Sugar, Tobacco, Fruits, Cotton, and Coffee are the Chief Products: **3385, 3509, 2011, 904, 822, 936, 1859, 2885-6, 1561, 3126, 1545, 3541.**

— Typical Fruits: Bananas, Pineapples, Oranges, Lemons, Grapefruit, Mangoes, Guavas and Alligator Pears.

B. Rare Woods: Mahogany, Lignum Vitae, Ebony, Rosewood, Logwood, and Satinwood 3718, 936, 1859, 1561, 3126, 2886, 1073, 2046.

C. Live Stock: **936, 2886.**

D. Other Products: Cocoa 1561, 1545, 2156, 3541; Spices 1859, 1545; Sponges and Sisal 305; Asphalt 3541; Guano and Phosphate Rock 2886.

E. Metals: The deposits of Iron, Manganese, Copper, Gold, and Silver in the islands have not been developed 936, 1560, 3126, 2886.

V. DIVISIONS OF WEST INDIES: The West Indies fall into three great natural groups: (1) the **Bahamas;** (2) the **Greater Antilles,** including Cuba, Jamaica, Haiti, and Porto Rico; and (3) the **Lesser Antilles,** including the Leeward Islands, the Windward Islands, Barbados, Trinidad and Tobago, and the chain of small islands off the north coast of South America, the most important of which form the Curaçao group.

A. Bahamas: **305** (British). Comprise more than 3,000 islands; area, about 4,400 square miles; population, about 60,000. Capital and chief city, **Nassau.** Principal islands: New Providence, Grand Bahama, Abaco, Eleuthera, Andros, Exuma, Cat, Watling or San Salvador, Acklin, and Great Inagua. The Turks and Caicos Islands belong geographically to the Bahamas, but are under the government of Jamaica.

B. Cuba: **936** (Independent). Area, including Isle of Pines, 44,200 square miles; population, about 2,900,000. Chief Cities: **Havana** (capital), **Camaguey, Cienfuegos, Santiago de Cuba, Guantanamo, Santa Clara, Matanzas,** and **Manzanillo.**

C. Jamaica: **1859** (British). Area, about 4,200 square miles; population, about 900,000. Capital and chief city, **Kingston.** Area of Turks and Caicos Islands (see Bahama), 224 square miles; population, about 5,500; Cayman Islands, about 100 square miles; population, about 5,500.

D. Haiti: **1560.** This island is divided politically into two parts:

a. Republic of Haiti: **1560.** Area, about 10,200 square miles; population, about 2,500,000. Capital and chief city, **Port-au-Prince.**

b. Republic of Santo Domingo: **3125.** Area, about 19,000 square miles; population, about 955,000. Capital and chief city, **Santo Domingo.**

E. Porto Rico: **2885** (United States). Area, about 3,600 square miles; population, about 1,300,000. Capital and chief city, **San Juan.**

F. **Leeward Islands** (United States): Consisting of part of **Virgin Islands (3651)**; area, 132 square miles; population, 26,000. Principal islands: St. Croix, St. Thomas, and St. John. Chief City, **St. Thomas** (formerly Charlotte Amalie).

G. **British Leeward Islands:** Area, 715 square miles; population, about 127,000. Principal islands: British Virgin Islands (3651), comprising Tortola, Virgin Gorda, Anegada, Jost-VanDykes and about 30 smaller islands; St. Kitts, Nevis and Anguilla; Antigua, Barbuda, and Redonda; Montserrat; and Dominica. Chief city, **St. John** on Antigua Island.

H. **French Leeward Islands:** Area, 688 square miles; population, about 215,000. Principal islands: **Guadeloupe (1545)** and Marie Galante. Chief cities, **Basse-Terre** (capital) and **Pointe-à-Pitre.** Under the Guadeloupe government is included one half the island of St. Martin, the other half, with St. Eustache (or Eustatius), belonging to the Dutch colony of Curaçao (see below).

I. **Windward Islands:**
   a. **Martinique: 2156** (French). Area, 385 square miles; population, about 195,000. Capital and chief city, **Fort de France.**
   b. **British Windward Islands:** Area, about 530 square miles; population, about 190,000. Principal Islands: St. Lucia, St. Vincent, Grenada, and the Grenadines, Chief cities, **St. George, Castries,** and **Kingstown.**

J. **Barbados: 329** (British). Area, 166 square miles; population, about 200,000. Capital and chief city, **Bridgetown.**

K. **Trinidad and Tobago: 3541** (British). Area of Trinidad, 1860 square miles, of Tobago, 114 square miles; joint population, about 385,000. Chief cities, **Port of Spain** (capital) and **Scarborough.**

L. **Curaçao Group:** (Dutch). Area, 403 square miles; population, about 55,600. Principal islands: Curaçao Bonaire, and Aruba. Capital and chief city, **Willemstad.** The government of Curaçao extends to the Dutch possessions in the Leeward Islands—St. Eustache and one half of St. Martin.

# SOUTH AMERICA

SOUTH AMERICA is today the continent of opportunities. Endowed with unlimited natural resources, every variety of climate and land formation, rich mineral deposits, great rivers, vast forests, and fertile plains, the southern half of the New World can look forward to a future of ever-increasing prosperity and power. In the past it has suffered from the same unfortunate heritage as Mexico and Central America, the heritage of ruthless conquest and exploitation by the first European colonizers. The new nations which sprang up from the ashes of foreign misrule have suffered from internal disorders and the blights of war. Vast wealth in the hands of the few has too often been dissipated in fomenting political plots and revolutions, and the natural resources of this favored continent have frequently been sold by unscrupulous leaders to foreigners who have drawn away the profits of their enterprises to other lands. Today, however, the South American nations have for the most part begun to build on a solid foundation, developing their own resources with the constructive aid of foreign capital, and looking after the education of their people. Many South American cities rank as the most progressive centers in the world, not only in such things as engineering, sanitation, schools, and transportation, but also in fostering the higher arts and general education.

I. PHYSIOGRAPHY:

A. **Comparison with North America: 3284.**

B. **Mountains and Highlands:** See map opposite page 3288.
   a. **Andes, extending along the West Coast from Isthmus of Panama to Cape Horn: 122.**
      1. Part of "world ridge" which in North and South America is known as the Cordillera System: 2515, 122.
      2. Longest of all mountain chains and surpassed in height only by Himalayas: 123, 3284.
         —Aconcagua is the highest peak 10; other peaks 123.
      3. Andes are young, growing mountains as shown by presence of active volcanoes and frequent earthquakes: 3284, 123.
   b. **Brazilian Highlands or Table-Land in the East: 3284, 494.**
      —Old and worn-down mountain system like the Appalachians of North America.
   c. **Guiana Highlands and Plateau in the North: 1546, 3620.**

C. **Plains:** About two-thirds of South America consists of lowland plains which are divided about equally into forest lands and grasslands. Near the Andes are strips of desert or semi-desert lands.
   a. **Amazon Lowland, the Largest River Basin in the World: 105, 493.**
      —Covered with a dense tropical forest: 105, 3284.
   b. **Guiana Lowlands and Coastal Plain: 1546.**
   c. **Temperate Zone Forests Cover Portions of South Central Plains such as the Gran Chaco: 190, 2676.**
   d. **Treeless Grasslands:**
      1. Llanos of Colombia and Venezuela: 836, 3620, 2600.
      2. Grasslands of Southern Brazil, Paraguay, and Uruguay: 494, 2676, 3608.
      3. Pampas of Argentina: 190–1, 3285.
      4. Savannas of Guiana: 1546.

D. **Rivers and Lakes of South America:** All the important rivers of South America empty into the Atlantic Ocean. The Andes crowd the Pacific coast so closely that there is no opportunity for large rivers to form on that side of the mountains.
   a. **Magdalena River in the Extreme North with Its Chief Tributary, the Cauca: 836.**
   b. **Orinoco River: 2600.**
   c. **Amazon River with More Than 200 Tributaries: 105.**
   d. **Tocantins and Sao Francisco Rivers, Both Rising in the Brazilian Highlands: 494.**
   e. **Plata River Formed by the Junction of the Uruguay and Parana Rivers: 2831.**
   f. **Rio Negro Forming the Northern Boundary of Patagonia: 2692.**
   g. **Lake Titicaca Largest Lake in South America: 449, 2742** (picture).

E. Coastline:
   a. **Coastline is Regular with No Large Projections, Peninsulas, or Bays such as Those of North America: 3286.**
   b. **Southern Coast of Chile Marked by Jagged Fiords and Chain of Coastal Islands: 3286.**

Note: Just as the land mass of North America is slowly sinking in the north and rising from the sea in the south, so South America is slowly rising in the north and sinking in the south. This accounts for the broken coastlines at the opposite extremities of each continent and the smooth even coasts of southern North America and northern South America.

F. **Chief Islands Near South America:**
   a. **Tierra del Fuego Group at the Southern Tip Separated from Mainland by Magellan Strait: 3285, 735, 123.**
   b. **Trinidad and Falkland Islands (British): 3541, 1223.**
   c. **Juan Fernandez Islands: 737, 933.**
   d. **Galapagos Islands: 1079.**

II. CLIMATE:

A. **Intensely Hot and Damp in Tropical Lowlands and Coastal Plains: 494, 3622, 835, 1079, 1546.**
   a. **Altitude of Tropical Highlands Gives Them Temperate Climate: 3622, 835, 1078, 449, 122.**
   b. **Snow and Intense Cold in Tropical Mountains: 3285, 449.**

B. **Climate of Temperate Zone to the South Resembles that of United States and Canada: 191, 736, 3608.**

C. **Rainfall:** See Rainfall Map opposite page 3288, and on page 2973.
   a. **Tropical Lowlands East of Andes have Heavy Rainfall: 2972, 494, 190–1.**
   b. **Prevailing Easterly Winds in Tropical North Deposit Their Moisture on Eastern Slopes of Andes, Leaving Most of West Coast Arid: 2741, 122.**
      —Modifying effects of the Antarctic current: 1078.
   c. **Prevailing Westerly Winds in Temperate South Deposit Moisture on Pacific Side of Andes, Leaving Interior Mountain Slopes and Plains Arid: 122–3, 191.**
   d. **Tremendous Rainfall in the Extreme South: 735–6.**

D. **Seasons:** It must be borne in mind that below the Equator in South America, the Seasons are the reverse of those in the Northern Hemisphere, so that January and February are the mid-Summer months, while July and August are the mid-Winter months: 3285.

III. MINERAL RESOURCES OF SOUTH AMERICA: **3289.**

A. **In Northern Andes:** Amethysts and Emeralds, Platinum, Gold, Silver, Quicksilver or Mercury, Copper, Lead, Zinc, Magnesium, Antimony, Iron, Coal, Petroleum and Asphalt: 836, 1079, 2742.

B. **In Central Andes:** Gold, Silver, Tin, Nickel, Copper, Tungsten, Lead, Iron, Manganese, Antimony, Bismuth, Sulphur, Coal, Gypsum, Borax, and Nitrates: 450, 736, 192, 3289.

C. **In Southern Andes:** This part of the mountains is much poorer in minerals than the northern regions, and there has been virtually no development of mineral resources except coal (3289).

D. **In Guiana Highlands:** Gold, Aluminum, Copper, Iron, Coal, Petroleum, and Asphalt 1546, 3622.

E. **In Brazilian Highlands:** Diamonds, Iron, and Gold are most important; others are Platinum, Thorium, Silver, Copper, Lead, Mercury, Manganese, Coal, and Graphite 3289, 494.

IV. VEGETATION AND ANIMAL LIFE: **836, 1546, 1079, 493, 2742, 450, 2677, 736, 191, 106**

A. **Typical South American Plants:**
   a. **Native Plants:** Quebracho 2677; Brazilwood 3284; Rubber Trees 3072–3; Ivory Palm 549; Araucarian Pine 3533; Cinchona 2950; Sarsaparilla 3127; Indigo 1777; Tolu Balsam 2728; Fustic or Dye Wood 1050; Bamboo 323; Cacao 562; Coca 2742; Maté 3286 (picture); Orchids 2593; Giant Water-Lilies 3699; Cotton 904–5; Potato 2900; Tomato 3513; Tobacco 3510; Pineapple 2809.
   b. **Plants introduced by Whites:** Coffee 822; Sugar Cane 3385; Oranges 2588; Bananas 324.

B. **Typical South American Animals:** Monkeys 2289–90 (text and pictures); Jaguar 1859; Puma 2933; Tapir 3434; Llama and Guanaco 2039; Alpaca and Vicuna 100; Pudu or Dwarf Deer, Pampas Deer, and Guemal 981; Peccary 2706; Chinchilla 752; Sloth 3252; Armadillo 211; Ant-Eater 145; Vampire Bat 346; Manatee or Sea Cow 2134; Opossum 2585; Rhea 2603; Condor 856; Toucan 3520; Hoatzin 401 (pictures); Parrots and Macaws 2690; White Ibis 3364; Flamingo 1289; Alligator 98; Matamata Turtle 3563; Iguana and Teguexin 2036; Boa Constrictor and Anaconda 440.

V MANKIND IN SOUTH AMERICA:

A. **Discovery, Exploration, and Conquest:** See map page 110.
   a. **Columbus in 1498 Reaches South America: 3289, 849.**
   b. **Americus Vespucius and His Claims to Discovery: 3634.**

c. In 1500 Vicente Pinzon Discovers Brazil for Spain, but Pedro Cabral Takes Possession for Portugal: 496.
d. Juan de Solis in 1515 Visits Argentina Coast: 192, 109.
e. Magellan in 1520 Sails Around South America: 2115.
f. Sebastian Cabot in 1526–7 Explores Plata River Region: 192, 562.
g. Francisco Pizarro in 1530 Begins Conquest of Peru (including Bolivia): 2814.
h. Pizarro's Men in 1534 Conquer Ecuador: 1079.
i. In 1535 Spaniards Invade Chile: 738.
j. In the same year Juan de Ayolas Founds Asuncion in Paraguay: 2677.
k. Conquest and Colonization of New Grenada (Colombia): 836.
l. Sir Francis Drake's Famous Voyage along the West Coast: 1030.
m. Sir Walter Raleigh's Fruitless Expeditions: 2975–6, 1547.

B. Peoples of South America:
a. Traces of Prehistoric Peoples:
1. Ruins of Tiahuanaco in Bolivia: 449.
2. Remains of Ancient Civilization in Ecuador: 1078.
b. The Great Empire of the Incas: 1741.
c. Indian Types in South America Today: 3869.
d. White and Mixed Population:
1. Whites Mostly of Spanish and Portuguese Blood: 3286–8, 495.
2. Mestizos of Mixed Indian and European Stock Form Majority of Population: 3288, 3622.
3. Negro Element Important in Brazil: 2434, 495.
e. No Race Prejudice in South America: 3288.

C. Distribution of Population: See map opposite page 3288. Notice how the centers of densest population are still on or near the sea coast, while the vast interior has, for the most part, less than three people to the square mile.

# Countries of South America

I. COLOMBIA: 835.
A. Boundaries and Chief Physical Features: Colombia is bounded on the north by the Caribbean Sea, on the west by the Isthmus of Panama and the Pacific Ocean, on the east by Venezuela and Brazil, and on the south by Ecuador and Peru. The northwestern half consists of Andes Mountain ranges and a small coastal plain on the Gulf of Darien; the southeastern half forms part of the Orinoco and Amazon River basins.
B. Area, about 440,000 square miles; Population, about 5,800,000.
C. Chief Products: Coffee, Sugar, Cocoa, Bananas, Cotton, Hides, Platinum, Gold, and Emeralds.
D. Chief Cities: Bogota (capital), Barranquilla, and Cartagena.

II. VENEZUELA: 3620.
A. Boundaries and Chief Physical Features: Venezuela is bounded on the north by the Caribbean Sea, on the east by the Atlantic Ocean and Guiana, on the west by Colombia and on the south by Brazil. A great northeastern spur of the Andes crosses Venezuela, separating the basin around Lake Maracaibo (3621) and the Gulf of Venezuela from the Orinoco Lowlands. To the south of the Orinoco River, which cuts the country into two almost equal parts, lie the Guiana Highlands.
B. Area, about 394,000 square miles; Population, about 2,500,000.
C. Chief Products: Coffee, Cocoa, Rubber, Sugar, Hides, and Gold.
D. Chief Cities: Caracas (capital), Valencia, and Maracaibo.

III. BRAZIL: 493.
A. Boundaries and Chief Physical Features: Brazil is bounded on the north by the Atlantic Ocean, Guiana, and Venezuela, on the east by the Atlantic Ocean, on the west by Colombia, Peru, and Bolivia, and on the southwest and south by Paraguay, Argentina, and Uruguay. The vast basin of the Amazon (105) occupies the northern, central, and western parts of Brazil. The southern and eastern parts contain the Brazilian Highlands, and the upper valleys of the Paraguay and Parana Rivers.
B. Area, about 3,292,000 square miles; Population, about 30,600,000.
C. Chief Products:
a. Brazil Produces Nearly Half of the World's Crude Rubber and Two-Thirds of the World's Coffee: 3072, 822.
b. Other Products: Sugar, Hides and Leather, Cotton, Meat, Cocoa, Tobacco, Beans, Yerba Maté, Timber, Diamonds, Platinum, Gold, and Manganese.
D. Chief Cities: Rio de Janeiro (capital) 3020, São Paulo, Bahia, Pernambuco, Para (or Belem), Porto Alegre, and Manaos.

IV. ECUADOR: 1078.
A. Boundaries and Chief Physical Features: Ecuador is bounded on the north and northeast by Colombia, on the east and south by Peru, and on the west by the Pacific Ocean. The Andes Mountains and Highlands occupy the western half of the country, surrounding a small plain on the Gulf of Guayaquil; the eastern half is part of the Amazon Basin.

B. **Area, about 116,000 square miles (settlement of boundary disputes with Peru may increase this area); Population, about 2,000,000.**
C. **Chief Products:** Cocoa, Coffee, Rubber, Vegetable Ivory, Tobacco, Gold, and Panama Hats.
D. **Chief Cities:** Guayaquil and Quito (capital).

V. **PERU: 2741.**
A. **Boundaries and Chief Physical Features:** Peru is bounded on the north by Colombia and Ecuador, on the east by Brazil and Bolivia, on the west and southwest by the Pacific Ocean, and on the south by Chile. The Andes cover southern, central, and northwestern Peru, with the exception of a small coastal plain in the northwestern corner. A narrow strip of eastern Peru and a large tongue of land in the northwest belong to the Amazon Basin. This tongue of land consists chiefly of the valley of the Maranon River (105).
B. **Area, about 722,000 square miles (including some of the disputed regions); Population, about 4,500,000.**
C. **Chief Products:** Sugar, Cotton, Rice, Cocoa, Coffee, Wool, Hides, Quinine, Cocaine, Rubber, Copper, Petroleum, and Silver.
D. **Chief Cities:** Lima (capital) 2009, and Callao.

VI. **BOLIVIA: 448.**
A. **Boundaries and Chief Physical Features:** Bolivia is bounded on the north and east by Brazil, on the west by Peru and Chile, on the south by Argentina and Paraguay. Bolivia and Paraguay are the only South American countries which are cut off from the sea. The Andes and a high enclosed tableland occupy central and southwestern Bolivia, the remainder is divided between the Amazon Basin and the basin of the Paraguay River.
B. **Area, about 514,000 square miles; Population, about 3,000,000.**
C. **Chief Products:** Tin, Silver, Rubber, Copper, Lead, Zinc, Cocoa, and Coffee.
D. **Chief Cities:** La Paz (the actual seat of government), Cochabamba, Sucre (the nominal capital).

VII. **CHILE: 735.**
A. **Boundaries and Chief Physical Features:** Chile is bounded on the north by Peru, on the east by Bolivia and Argentina, and on the west by the Pacific Ocean; on the south the boundary extends at a right angle across the tip of the continent to the Atlantic, then drops southward again through Tierra del Fuego. The Andes cover all of Chile, enclosing in the north a strip of lowland called the Atacama Desert, and in the center a long strip of fertile valley land. The rugged southern coast is fringed with numerous islands.
B. **Area, about 290,000 square miles; Population, nearly 4,000,000.**
C. **Chief Products;** Nitrates, Copper, Coal, Manganese, Silver, Wheat, Grapes, Beans, Hides and Leather, Meat, and Wool.
D. **Chief Cities:** Santiago (capital) 3125, Valparaiso 3615, Concepcion, Antofagasta.

VIII. **PARAGUAY: 2676.**
A. **Boundaries and Chief Physical Features:** Paraguay (including disputed territory) is bounded on the north by Bolivia, on the northeast and east by Brazil, and on the west, south, and southeast by Argentina. Paraguay, like Bolivia, has no coastline. It has no mountains or important highlands, but lies entirely in the Paraguay-Parana River Basin.
B. **Area, about 195,000 square miles (including about 130,000 square miles which is in dispute with Bolivia); Population, about 1,000,000.**
C. **Chief Products:** Live Stock, Meat and Hides, Yerba Maté, Tobacco, Oranges, and Sugar.
D. **Chief Cities:** Asuncion (capital) and Villa Rica.

IX. **ARGENTINA: 190.**
A. **Boundaries and Chief Physical Features:** Argentina is bounded on the north by Bolivia and Paraguay, on the east by Brazil, Uruguay, and the Atlantic Ocean, and on the west and south by Chile. The western strip of Argentina is occupied by the Andes mountains and their semi-desert slopes; the middle and eastern strips consist of lowlands divided as follows: in the north, the Gran Chaco forest lands; in the center, the Pampas grasslands; and in the south, the bleak prairies of Patagonia.
B. **Area, 1,153,000 square miles; Population, about 9,000,000.**
C. **Chief Products:** Meat, Hides, Wool, Wheat, Corn, Flax, Oats, Cotton, Sugar, Grapes, Tobacco, Clothing, and Petroleum.
D. **Chief Cities:** Buenos Aires (capital) 525, Rosario, Cordoba, La Plata, Tucuman, Santa Fé, and Mendoza.

X. **URUGUAY: 3607.**
A. **Boundaries and Chief Physical Features:** Uruguay is bounded on the north and northeast by Brazil, on the southeast by the Atlantic Ocean, on the south by the mouth of the Plata River, and on the west by Argentina. The country consists almost entirely of a low fertile plain, watered by numerous streams.
B. **Area, about 72,200 square miles; Population, about 1,460,000.**
C. **Chief Products:** Cattle, Wool, Hides, Wheat, Flax, Oats, Grapes, Tobacco, Olives, Gold.
D. **Chief Cities:** Montevideo (capital) 2316, and Salto.

XI. **GUIANA: 1546.**
A. **British Guiana:**
a. **Boundaries and Chief Physical Features:** British Guiana is bounded on the north and northeast by the Atlantic, on the east by Dutch Guiana, on the west by Venezuela and Brazil, and on the south by Brazil. The Guiana Highlands rise on the south and west, the remainder consisting of a low coastal plain.

b. **Area, about 90,000 square miles; Population, about 310,000.**
c. **Chief Products:** Sugar, Rum, Timber, Coconuts, Rice, Diamonds, and Gold.
d. **Capital and Chief City, Georgetown.**

B. **Dutch Guiana or Surinam:**
a. **Boundaries and Chief Physical Features:** Dutch Guiana is bounded on the north by the Atlantic, on the east by French Guiana, on the west by British Guiana, and on the south by Brazil. More than half the country lies in the Guiana Highlands.
b. **Area, 46,060 square miles; Population, about 113,000.**
c. **Chief Products:** Sugar, Cocoa, Bananas, Coffee, Rice, Corn, Molasses, and Gold.
d. **Capital and Chief City, Paramaribo.**

C. **French Guiana:**
a. **Boundaries and Chief Physical Features:** French Guiana is bounded on the north and northeast by the Atlantic, on the southeast and south by Brazil, and on the west by Dutch Guiana. The country is divided about equally between the Guiana Highlands and the coastal plain.
b. **Area, about 32,000 square miles; Population, about 50,000.**
c. **Chief Products:** Gold, Silver, Iron, Phosphates, Rice, Corn, Sugar, and Tobacco.
d. **Capital and Chief City, Cayenne.**

# EUROPE

JUDGED by its size alone, Europe is a minor division of the Earth's surface. Indeed, it is little more than a broken and irregular peninsula projecting westward from the vast land mass of Asia, and it is treated as a separate continent only because of its racial and historical individuality. Between Europe and Asia there is no sharp natural division as there is between Asia and Africa or North and South America. Many geographers, in fact, treat the two together under the name of Eurasia. Of the six so-called continents, Australia alone is smaller than Europe. Yet, in the history of modern civilization and in the broadest geographical sense, Europe has played by far the most important part of all the continents. It has given its "point of view" to the world. When we speak of the discovery of a country, we mean its discovery *by Europeans*. The New World was "new" only from the European standpoint, not from that of the Aztecs or Incas or Iroquois. Americans still speak of eastern Asia as the "Orient" and the "Far East," although, by the closest route from America these lands lie to the West or Occident. That is because North and South America are the heirs of Europe, in race, language, customs, and ideas. The same is true of Australia and Africa and the islands of the Pacific. Only the ancient civilizations of Asia have been able to withstand the dominating influences which spread from the shores of the Mediterranean and the eastern Atlantic. Why did Europe prevail over so much of the world in this extraordinary manner? An adequate answer to that question would involve countless subtle forces and influences which it is perhaps impossible to analyze fully, but it is certain that Geography would play an important part in the solution of the problem. In the various sections of this outline we shall review briefly some of the more important geographical factors in the supremacy of Europe.

I. POSITION AND AREA:

A. **Europe is situated in the center of the land masses of the globe, about equally distant from the midpoints of all the four larger continents. This gives Europe an enormous commercial and political advantage. This advantage of position will be made apparent by a glance at the map of the world on page 2973.**

B. **The area of Europe (about 3,900,000 square miles) is about half that of South America; about two-fifths of North America; about one-third of Africa; and slightly more than one-fifth of Asia. The overcrowding of this comparatively small area forced Europe to seek food supplies in other lands, and an outlet for its surplus population.**

II. PHYSIOGRAPHY:

A. Geologic Influences:
a. **The Glaciers of the Ice Age Covered Most of Northern Europe: 1720, 1466.**
b. **The Sinking of the Land:** The exceedingly irregular outline of Europe, with its countless peninsulas and bays, its land-locked seas, and its numerous islands, indicates that the continent, after emerging from the oceans in remote geologic ages, has sunk back again to a certain extent, allowing the water to invade its lowest areas (1187).
1. Great Britain was once part of mainland: 1191.
2. North Sea was once dry land: 2528.
3. Fiords of Norway created by sinking of seacoast: 2529–30, 2788, 2789 (picture).
4. Italy and Spain were once connected by land with Africa: 3230, 3299.
5. See map of Heights and Depths opposite page 1190; the white areas indicate waters less than 500 feet deep, where the land probably projected at comparatively recent geologic periods.

B. **Mountains and Highlands: 1190.** The mountains of Europe are, as a whole, comparatively low and scattered, and nowhere do they cut off large interior areas from the moist sea winds, as do the mountains of other continents. The result is that Europe has well-distributed rainfall and is the only continent which has no desert regions. In general the mountains of the south are young in the geographic sense, while those of the north are old and worn-down ranges.

a. Central and Southern Mountain Groups. The following mountains are all more or less linked together by intervening highlands: **Alps 101; Apennines 154; Dinaric Alps 1190; Transylvanian Alps 3081; Carpathian Mountains 646; Balkan Mountains and Pindus Mountains 307.**

b. Central Highlands: **1192.** In this group are included the following: **French Highlands 1345; Jura Mountains 1903; Vosges Mountains 3662; Black Forest 433; Bavarian Highlands 346; Thuringian Hills and Harz Mountains 1439-40, 1595; and Bohemian Mountains 447.**

c. Southwestern Mountains and Highlands: **Pyrenees 2940;** Sierra Nevada and other ranges and plateaus forming part of the Iberian or Spanish Peninsula **3299** (table), **3300** (map).

d. Northwest Highlands: These are the remains of an ancient mountain chain which once stretched in a great unbroken curve from the western tip of France, through the British Isles, across what is now the North Sea, and up into the Scandinavian Peninsula. They include the following: **Brittany Highlands 514, 1345; Highlands of England and Wales, Ireland and Scotland 1150, 3664, 1807, 3146; Kiolen Mountains of Scandinavia 2529, 3402; Manselka Mountains of Finland 1248.**

e. Mountains of the Extreme East and Southeast: **Ural Mountains 3606; Caucasus Mountains 663.**

C. Lowlands: Europe has a greater proportion of fertile lowland plains than any other continent.

a. Great Central Lowland: **1190-1.** In western Europe the lowland plains are hemmed in between the Central Highlands and the Northwestern Highlands, and are cut up by the arms of the sea; but in eastern Europe, the plains broaden out, covering virtually all of European Russia. The regions included are as follows: **English Plain 1150; Paris Basin 1345; Lowlands of Belgium and Holland 372, 2438; North German Plain 1439; Plains of Denmark and Southern Sweden 994, 3402;** and **Great Plains of Russia 3085.**

b. Smaller European Lowlands: **Hungarian Plain 1702; Lombardy Plain or Basin of the Po River 2848, 2047; Garonne Basin 1345.**

D. Coastline: **1188.** The broken coastline of Europe, with countless arms of the sea, large and small, reaching into the interior, not only provides numerous natural harbors, which have encouraged seafaring and commerce since the dawn of history, but allows the influence of these many bodies of water to temper the climate of the continent. For the names of the principal bays and gulfs, see the map next to page 1196.

a. Effect of Natural Harbors on Civilization: **1578.**

b. Europe's Coastline Compared with Africa's: **33.**

E. Seas and Chief Rivers Flowing into Them:

a. Mediterranean: **2193.** Because the southern mountain ranges crowd so close to its shores, there are comparatively few important rivers flowing into the Mediterranean: **Rhone River 3012.**
—Chief Divisions of the Mediterranean: **Adriatic Sea 26,** into which empties the **Po River 2848;** and **Aegean Sea 27.**

b. Atlantic Ocean: **254.**
1. Rivers of the Iberian Peninsula: **Guadalquivir, Guadiana, Tagus, and Douro 3299** (table).
2. French Rivers: **Garonne 1345; Loire 2047.**

c. North Sea and English Channel: **2528.**
—Seine River **3173; Thames 3482; Meuse 2207; Rhine 3005; Elbe 1107.**

d. Baltic Sea: **321.**
—Oder River **1439;** Vistula **3651.**

e. White Sea, with the Dvina River; and Arctic Ocean, with the Pechora River: **1188, 3085.**

f. Black Sea: **434.**
—Danube River **961;** Dnieper, Don, Dniester **1188.**

g. Caspian Sea: **653.**
—Volga River **3660.**

F. Chief Islands Belonging to Europe: **Iceland 1722; Great Britain 1509; Ireland 1807; Danish Islands 994; Balearic Isles 307; Corsica 894; Sardinia 3126; Sicily 3229; Crete 918.**

III. CLIMATE: **1188, 1194.**

A. Climate of Europe is Chiefly of the Oceanic Type: **794-5.**

a. Russia has Continental Climate Similar to North American Plains: **3086.**

b. Gulf Stream Warms Western Europe: **1549.**

c. Scandinavia and Southern Italy Present Two Extremes: **2530, 1835.**

d. Effect of Warm West Winds: **1188.**

B. Rainfall: see map opposite page **1190,** and map on page **2973.**
There are no high mountain ranges in the west to prevent moist Atlantic winds from penetrating the heart of Europe. The even distribution of rain enables the fertile soil of the extensive lowlands to produce maximum crops with great regularity.

IV. PEOPLES OF EUROPE:

A. Prehistoric Races: **2133, 666.**

B. Primitive Stock of Present Races: **2956.**

C. Racial Groups of Historic Times: **3866-7.**

D. Diversity of Types, Customs, and Language: **1192-3.** The fact that Europe is cut up into many separate little regions by short mountain chains and by arms of the sea has tended to produce a tremendously varied and versatile group of independent types, each contributing in a different way toward a single great continental civilization.

# Great Britain and Ireland

CUT off by water from the rest of Europe, Great Britain has been compelled to develop its commerce by sea. As the population of these small islands increased, the products of the home farms no longer sufficed to feed the inhabitants, and Great Britain was compelled to buy foreign food. To pay for this food, manufacturing industries had to be developed. The presence of coal and minerals on the islands favored this development. To maintain the manufacturing industries, raw materials had to be imported. To establish sure sources of raw materials and to control markets for manufactured products, Great Britain struggled for and obtained colonies in all quarters of the globe. To protect this colonial empire, Great Britain built a powerful navy. These are the chief factors in the evolution of these small islands into a world power controlling one-fourth of the inhabitable lands of the earth.

I. PHYSIOGRAPHY:
- A. Islands with Irregular Coastline Produced by Sinking of Land: **2528, 3146.**
- B. General Characteristics:
  - a. Description of English Country: **1150, 1157-8.**
  - b. Wales, a Country of Hills and Low Mountains: **3664.**
  - c. Scotland and Its Highlands: **3146.**
  - d. Ireland, an Inland Plain Surrounded by Low Mountains: **1807.**
- C. Soil: Fertile in England **1150**; Poor in Scotland **3146**; Thin in Ireland **1807.**
- D. Lesser Islands: Hebrides 1625; Shetland Islands 3206; Isle of Man 2134; Orkney Islands 2601; Channel Islands 687.

II. CLIMATE AND NATURAL RESOURCES:
- A. Climate Tempered by Gulf Stream; Has No Great Extremes of Temperature: **1150, 1549.**
- B. Heavy Rainfall in Most Parts of the British Isles: **1158, 3147, 1807.**
- C. Natural Resources:
  - a Irregular Coastline Provides Many Good Harbors: **1150.**
  - b. Coal, Iron, Tin, Copper, Zinc, and Lead: **1150, 1158, 3664, 3504.**
  - c. Rich Fishing Ground in the North Sea: **2528.**

III. CHIEF INDUSTRIES:
- A. Manufacturing: Cotton Goods 1158; Woolens 1160; Linen 1807-8, 1291 (picture); Silk 3235; Porcelain and Pottery 2883, 2906; Iron and Steel Products 1826; Shipbuilding 3146.
- B. Mining: See references to minerals under Natural Resources.
- C. Fisheries: **1286, 3147.**
- D. Agriculture: **3146, 1807-8.**
- E. Stock Raising and Dairying: **1807.**

IV. COMMERCE AND TRANSPORTATION:
- A. History of English Trade: **1154-5.**
- B. Importance of Trade with Colonies: **265, 269, 2499.**
- C. Transportation:
  - a. British Shipping; Importance of Sea Power: **1154-5, 3219, 2424.**
  - b. Rivers and Canals: **1985, 2134, 1150, 625-6, 3482.**

V. CHIEF CITIES:
- A. In England: London **2048**; Birmingham **427**; Liverpool **2031**; Manchester **2134**; Sheffield **3200**; Leeds **1985**; Bristol **510**; Newcastle-upon-Tyne **2449**; Portsmouth **2887**; Plymouth **2841**; Southampton **3290**; Dover **1027.**
- B. In Scotland: Glasgow **1470**; Edinburgh **1080**; Aberdeen **2.**
- C. In Ireland: Dublin **1043**; Belfast **371**; Cork **888**; Queenstown **2950.**

Note: These cities are all seaports, or closely connected with the sea by great systems of canals.

## BRITISH POSSESSIONS

I. SELF-GOVERNING DOMINIONS: Australia **261**; Canada **601**; Ireland **1807**; New Zealand **2499**; Union of South Africa **3279.**

II. INDIAN EMPIRE AND ASSOCIATED STATES: **1743.**

III. COLONIES, PROTECTORATES, AND DEPENDENCIES:
- A. In Europe: Gibraltar **1458**; Malta **2131.**
- B. In Africa:
  - a. Egypt and the Anglo-Egyptian Sudan: **1092.** In March 1922 Egypt was declared independent, Great Britain retaining control of foreign relations and defense.
  - b. British Somaliland: see map next to page 41.
  - c. British East Africa: **1068.** This includes Kenya Colony and Protectorate (former East Africa Protectorate), Uganda Protectorate, Tanganyika Territory (former German East Africa) **3432,** Zanzibar Protectorate and Pemba **3838.**
  - d. Nyasaland Protectorate: see map next to page 41.
  - e. South Africa: **3279.** This comprises those British possessions which are not part of the Union of South Africa, as follows: Rhodesia, Bechuanaland, Swaziland, and Basutoland.

f. Southwest Africa Protectorate (former German colony now administered by Union of South Africa): 3283.
g. West Africa Colonies: 40–1. These include Nigeria, Gold Coast, Sierra Leone, Gambia, and portions of the former German colonies of Cameroon and Togoland.
h. Islands: Mauritius 2174; St. Helena and Ascension Island (map opposite page 41).

C. In Asia: Cyprus 947; Aden 24; Bahrein Islands 2738; Ceylon 684; Laccadive Islands 1763; Andaman and Nicobar Islands 1756; Straits Settlements 2130; Malay States 2130; Hongkong 1678; Weihaiwei 3195.
Note: Great Britain holds a mandate over Palestine (2643) and a protectorate over the Arab kingdom of Irak which comprises Mesopotamia (2200).

D. In North and South America: Bermudas 386; Bahamas 305; Barbados 329; British Honduras 1676; Jamaica 1859; British Leeward Islands and British Windward Islands 3895; Trinidad and Tobago 3541; British Guiana 1547; Falkland Islands 1223.

E. Islands of the Pacific: British Borneo 468; British New Guinea (including Papua and the former German section of the island) 2451; New Britain Islands (formerly the Bismarck Archipelago) and Solomon Islands 2620; New Hebrides (ruled jointly with France) 2620; Fiji Islands 1239; British Samoa 3120; Santa Cruz Islands, Gilbert and Ellice Islands, Tokelau Islands, Tonga Islands, Cook Islands 2620–1, 2624.
Note: The former German section of New Guinea, the New Britain Islands, and the former German islands of the Solomon group are now under the Australian Commonwealth; former German Samoa and the Cook Islands are under the New Zealand Commonwealth.

# France

FRANCE is the most favorably situated of all the countries of Europe. Stretching from the North Sea to the Mediterranean, and facing the Atlantic Ocean on the west, France has broad open gateways to all avenues of world commerce. Having many neighbors to trade with—England, Belgium, Germany, Switzerland, Italy, Spain, and others only a little farther away—France is yet protected by mountains and water on all sides, except along the Belgian boundary. France's position gives her a variety of climate, ranging from the semitropical on the Mediterranean to the invigorating climate of Normandy, so that the soil will produce, with the aid of the abundant rains, almost any kind of crop. Yet these very advantages have in a measure held France back in the rivalry for world trade. Able to satisfy with home products virtually all their frugal requirements, the French have had in the past little incentive to strive for foreign commerce; nor has France been so overcrowded that the people have been compelled to emigrate and establish French trade in foreign lands. France's position as a world power, therefore, is not based on commercial success, as is Great Britain's, but rather upon the close bonds which hold the French people united in a spirit of strong nationalism, as well as upon the traditions of culture and intellectual leadership which prevail in the land.

I. PHYSIOGRAPHY:
A. Mountains and Highlands:
a. Chief Ranges: Alps 101; Pyrenees 2940; Jura Mountains 1903; Vosges Mountains 3662.
b. Lesser Ranges and Highlands: Ardennes Hills 1344; Auvergne Mountains and Cévennes Chain 1345; Highlands of Brittany and Normandy 1345, 514.
B. Plains: 1192, 1344; Paris Basin 1345; "Land of River Valleys" 1193.
C. Chief Rivers: 1345.
—Seine 3173; Loire 2047; Gironde and Garonne 1345; Rhône 3012.
D. Coastline:
a. Why France Has Few Natural Harbors: 1344.
b. Peninsulas and Bays: Peninsula of Brittany 514, 1344; Norman Peninsula 2513, 1344; Bay of Biscay and Gulf of the Lion 1344.
E. Island of Corsica: 894.

II. CLIMATE: The winds from the Atlantic bring abundant moisture and keep the temperature mild 1346.

III. NATURAL RESOURCES:
A. Fertile Soil: 1346.
B. Minerals: Coal, Iron, and Building Stone 1347–8.
C. Rivers Form Network of Valuable Waterways: 1346.
D. Forest Lands 1347.

IV. CHIEF INDUSTRIES AND PRODUCTS:
A. Agriculture is the Most Important Industry: 1346.
a. Principal Crops: Wheat, Oats, Rye, Barley, Potatoes, and Sugar Beets.
b. France Leads in Grape Growing: 1501, 1346.
c. Live Stock: Cattle, Horses, Sheep, Goats, Hogs, and Poultry 1346.
d. Small Farms and Peasant Ownership: 1347.
B. Fisheries: 1347, 1282. The principal products of the fisheries are Cod 1283; Oysters 2615, 2614 (picture); Sardines 3126.
C. Mining and Quarrying: 1347–8.
D. Manufacturing: Textiles and Leather 1348; Wine 1346; Gloves 1475; Perfumes 2728; Soap 3263; Porcelains 2883; Iron and Steel Products 1348; Sugar 3385.

E. Transportation:
a. Rivers and Canals: **1193, 1346, 625, 3012, 3173, 2047, 2207.**
b. Wonderful System of Roads: **1348.**
c. Railways Owned in Part by Government: **1348.**

V. CHIEF CITIES: Paris (capital) **2681, 1348**; Marseilles **2154**; Lyons **2092**; Bordeaux **466**; Lille **2008**; Strasbourg **103**; Nantes **2389**; Toulouse **1351** (map); St. Etienne **1348**; Nice **2505**; Hâvre **1601**; Rouen **2513**; Roubaix **1348**; Nancy **1348**; Reims **2992**; Amiens **117**; Brest **502**; Calais **570**; Orléans **2601**; Metz **2206**; Versailles **3633**; Dunkirk **1048.**

### FRENCH POSSESSIONS

I. IN AFRICA:
A. On the Mediterranean: Algeria (including part of the northern Sahara) **96**; Tunis **3549**; Morocco **2327.**
B. French West Africa: **40.** This includes the following colonies: **Sénégal, French Guinea, Dahomey, French Sudan, Upper Volta, Mauritania, Togo** (part of the former German Togoland), and most of the Sahara Desert (3105).
C. French Equatorial Africa or French Congo (including a part of the former German Cameroon): **40, 859.**
D. Other Colonies: Madagascar **2105**; French Somaliland **(map next to page 41)**; Reunion Island (see Fact-Index).

II. IN ASIA: French India **1756**; French Indo-China **1777**; Kwangchow **740** (map).

III. IN AMERICA: St. Pierre and Miquelon (see Fact-Index); Guadeloupe and Dependencies **1545**; Martinique **2156**; French Guiana **1547.**

IV. IN PACIFIC OCEAN: **2620, 2624.** These possessions include **New Hebrides** (owned jointly with Great Britain), **Loyalty Islands, New Caledonia, Marquesas Islands, Tuamotu Group, Society Islands** (including Tahiti), **Tubuai Islands,** and **Wallis Islands.**

## Belgium

BELGIUM is primarily a manufacturing nation. Most of the population is crowded into industrial centers, while the countryside is covered with small farms which are made to yield enormous crops by intensive cultivation along scientific lines. The portions of the Ardennes Highlands in the south which are not suitable for agriculture are devoted to live stock, principally sheep. Only along the sandy seacoast is there any considerable area of waste land. This thrifty use of every resource enables Belgium to support a greater number of people to the square mile than any other country in Europe. It is bounded on the north by the North Sea and the Netherlands, on the east by Germany and Luxemburg, and on the west and south by France.

I. PHYSIOGRAPHY:
A. General Character of the Country: **Sand Dunes along the Sea, Hills in the South, Fertile Plains in Between 372, 376.**
B. Chief Rivers: **Scheldt 3136**; **Meuse 2207.**

II. CLIMATE: The climate of Belgium is like that of northern France and southern England, with mild winters, cool summers, and an abundance of rain.

III. NATURAL RESOURCES:
A. Chief Minerals: **Coal, Iron, Tin, Sand for Making Glass 374, 376.**
B. Good Farm Land: **372.**

IV. CHIEF INDUSTRIES:
A. Agriculture: **372.** Principal Crops are Wheat, Rye, Flax, and Sugar Beets.
B. Mining and Fisheries: **374.**
C. Manufacturing is the Leading Industry: **374, 376.** Chief Products are Iron and Steel, Artificial Silk, Automobiles, Glass, Lace, Linen, Wool, Gloves, and Sugar.
D. River and Canal Navigation: **2207, 3136, 625, 374** (picture).

V. CHIEF CITIES: Brussels (capital) **520**; Antwerp **152**; Liége **1995**; Ghent **1456**; Bruges **518**; Ostend **374**; Louvain **2073.**

VI. BELGIAN COLONIAL TERRITORY: Congo State **859.**

### LUXEMBURG

GRAND DUCHY OF LUXEMBURG: **2085.** This is a small neutral territory lying between France, Belgium, and Germany. Its industries and other characteristics are similar to those of Belgium.

## Switzerland

THIS small nation came into existenee more than 500 years ago, the first of the countries of Europe to achieve popular liberty and a democratic form of government. Its power and wealth in those days was due to the fact that it was situated along the highways of commerce between Italy, Germany, and France. Switzerland has been able to maintain its independence throughout all the struggles that have swept Europe in the last five centuries for three chief reasons: (1) the bold liberty-loving character and military skill of its

people, (2) the protection afforded by the strong rivalry between neighboring states, none of which was willing to permit the other to occupy this strategic position in the Alps, and (3) the lack of great natural resources to tempt the more powerful nations to such determined efforts as would be necessary to seize and hold this vast natural fortress. Switzerland today is a land devoted to agriculture, manufacturing, and commerce—all on a small scale. Among the principal sources of prosperity are the scenery and climate which annually attract thousands of tourists who leave behind them great sums of money.

I. PHYSIOGRAPHY:
- A. Mountains: Alps **101**; Jura Mountains **1903**.
- B. Narrow Plateau between the Two Ranges: **3412**.
- C. Rivers Rising in Switzerland: Rhine **3005**; Rhone **3012**; Aar **3412, 3414**; Ticino **3414**; Inn **3414**.
- D. Other Physical Features: Many Lakes **3414**; Majestic Glaciers **3417**.

II. CLIMATE: **101**. The general altitude of Switzerland produces a climate much cooler than that of the surrounding lowlands.
There are heavy rains in summer and great snowfalls in winter.

III. NATURAL RESOURCES: The chief resources are the scenery (3413, 3417), the pasture land (3415), and the plentiful supply of water-power (3416).

IV. CHIEF INDUSTRIES:
- A. Tourist Business: **3416**.
- B. Dairying and Agriculture: **3415**. Chief Crops are Wheat, Rye, Oats, and Potatoes.
- C. Manufacturing: **3415**. Chief Products are Watches and Clocks, Silk and Cotton Goods, Cheese and Condensed Milk, Chocolate, Machinery, Clothing, and Salt.

V. CHIEF CITIES: Bern (capital) **386**; Zurich **3842**; Geneva **1411**; Basel (see Fact-Index).

# The Netherlands

NO nation in the world can boast of a more orderly civilization than that of the Netherlands, or Holland as it is more commonly called. With quiet determination and infinite patience, the Hollanders or Dutch have turned their small corner of land into a model country, overcoming vast natural obstacles, driving back the sea with dikes to make room for their carefully tended fields and dairy farms, and founding thriving factories despite the lack of coal and iron. Holland is primarily a commercial nation, whose prosperity rests upon thrift and the Dutch merchant's world-wide reputation for rigid honesty. The efficiency of the government is founded on the sound education of the people. Holland's important colonial empire is a reminder of the days when Dutch explorers and Dutch merchants boldly sailed into unknown seas in search of new lands and new markets.

I. PHYSIOGRAPHY:
- A. Alluvial Soil Brought by Three Rivers: **2438**.
- B. Nearly Half the Land is Below Sea Level: **2438**.
  - a. How the Sea is Kept Out: **1191** (picture).
  - b. How the Marshes are Reclaimed: **1827**.
- C. Land is Not Naturally Fertile: **1193**.
- D. Rivers: Rhine **3005**; Meuse or Maas River **2207**; Scheldt **3136**.

II. CLIMATE: Holland has the typically mild European climate 1188.

III. NATURAL RESOURCES: With the exception of a favorable situation for ocean commerce, a considerable area of pasture land, and some deposits of pottery clay, Holland has virtually no important natural resources.

IV. CHIEF INDUSTRIES:
- A. Dairying and Dairy Products: **2438–40**.
- B. Agriculture: Chief Crops are Rye, Oats, Potatoes, Sugar Beets, and Wheat.
  —Tulip Raising an Important Industry: 3547, 2440.
- C. Manufacturing: Textiles, Ropes, Dyes, Chemicals, etc.: **119, 3612, 3068**.
  —Holland is Famous for Diamond-Cutting (119) and Pottery (2906).
- D. Shipbuilding: **3068**.

V. COMMERCE AND TRANSPORTATION:
- A. Amount of Shipping: **3219**.
- B. Canals, Rivers, Railroads: **2438, 626**.
- C. Colonial Trade: **2438, 1879**.

VI. CHIEF CITIES: **2440–1**. Amsterdam (capital) **119**; Rotterdam **3068**; Hague **1558**; Utrecht **3612**.

## POSSESSIONS OF THE NETHERLANDS

I. DUTCH EAST INDIES: **1070**.
—Principal Islands: Java **1877**; Sumatra **3391**; Borneo (northern part belongs to Great Britain) **467**; Celebes **671**; Molucca Islands **1070**; New Guinea (eastern half belongs to Great Britain) **2451**; Timor **1073** map (eastern half belongs to Portugal).

II. DUTCH WEST INDIES:
—Dutch Guiana or Surinam **1546, 3899**; Curaçao Island Group **3895**.

# Germany

DURING the period when other nations of Europe were establishing colonies and laying the first foundations of their modern commercial prosperity, Germany remained a loose federation of states whose minor rivalries prevented any concerted national enterprise. When, under the leadership of Prussia, these states finally united to form the German Empire, most of the territory available for colonial expansion was already occupied. Neither the character of soil and climate nor the temper of the people inclined Germany to remain an agricultural nation like France. Already the products of the farms were insufficient for the expanding population. Germany's only opportunity lay in manufacturing and commerce. To sell the products of its factories, Germany was forced to compete for trade in lands over which it had no political control. The German merchants met the problem by such efficient organization that they were able to turn out goods of standard quality at a low price. The government aided them with subsidies when necessary, and soon Germany was the leading rival of Great Britain for the control of the world's commerce. Had the race for supremacy remained a peaceful one, Germany's prosperity would undoubtedly have continued to grow. But the military class which controlled the government believed it saw a short-cut to world dominion. Germany chose to draw the sword, and the great structure erected by years of careful industry collapsed in ruins.

I. PHYSIOGRAPHY:
   - A. Highlands in the South: 1439, 1441.
     - a. Bavarian Highlands: 346, 1441-2; Black Forest: 433.
     - b. Thuringian Hills and Harz Mountains: 1439–49, 1595.
     - c. Erzgebirge or "Ore Mountains" of Saxony: 3131.
   - B. Northern Germany is Part of Great European Plain: 1439, 1440, 1190–1.
   - C. Chief Rivers: Rhine 3005; Ems 1439; Weser 1439, 502; Elbe 1107; Oder 1439; Vistula 3651; Headwaters of Danube 961.
   - D. Coastline: On the North Sea 2528; on the Baltic Sea 321.

II. CLIMATE: The climate of Germany is on the whole drier and marked by greater extremes of temperature than in the lands to the west. The winds from the Atlantic have lost much of their moisture and equable temperature by the time they reach central Germany.

III. NATURAL RESOURCES:
   - A. Coal, Iron, Zinc, Copper, Tin, Nickel, Lead, Potash, Sulphur, Silver, Gold, and Building Stone: 1443, 3132, 1595, 2898.
   - B. Forests: 1441–2, 433, 1327, 1328.
   - C. Water-Power in Saxony: 3132.
   - D. Soil of North German Plain Unfavorable to Agriculture: 1440.

IV. INDUSTRIES:
   - A. Manufacturing: Iron and Steel Products 1443, 1444 (picture); Textiles 1444, 3132, 303; Chemicals and Dyes 1444, 303, 1049; Pottery (Porcelain and China) 1444, 3132; Beer 347; Wine, Jewelry, and Toys 303; Wood Products 1442.
   - B. Agriculture: Crops are raised in the unfavorable soil of the North German Plain by scientific farming. —Principal Crops: Wheat, Rye, Barley, Oats, Sugar Beets, Hops, Potatoes, Flax, Tobacco, and Grapes 1440, 1441, 303, 347, 3385, 1680.
   - C. Live Stock: 1440, 347, 3132, 1595.
   - D. Shipbuilding and Fisheries: 1440.

V. TRANSPORTATION:
   - A. Railways, Rivers, and Canals: 1439, 1444, 1107, 961, 3005, 626, 1568.
   - B. Effect of the World War on German Harbors and Shipping: 1440, 3811.

VI. PRINCIPAL DIVISIONS OF GERMANY: Prussia 2928; Bavaria 346; Württemberg 1441; Baden 303; Saxony 3131; Mecklenburg-Schwerin (see Fact-Index); Thuringia 3715; Hesse 1441; Oldenburg, Brunswick, Mecklenburg-Strelitz, Anhalt, Lippe, Waldeck, and Schaumburg-Lippe (see Fact-Index); Hamburg 1567; Lübeck 1576; Bremen 502.

VII. CHIEF CITIES: Berlin (capital) 385; Hamburg 1567; Münich 2369; Leipzig 1985; Dresden 1041; Cologne 833; Breslau (see Fact-Index); Frankfort-on-the-Main 1356; Düsseldorf 1443; Nüremberg 2543; Hanover 1576; Essen 1178; Chemnitz 3132; Stuttgart 1441; Magdeburg 1107; Bremen 502; Königsberg 1440; Stettin 1440; Aachen 1.

## TERRITORY LOST THROUGH WORLD WAR

I. HOMELAND TERRITORY: Alsace-Lorraine to France; Saar Basin Coal Mines to France; Moresnet, Eupen, and Malmédy to Belgium; part of Schleswig to Denmark; 22,500 square miles of eastern Germany to Poland, including a strip of Prussia giving Poland access to the Baltic Sea; part of Upper Silesia to Poland; the ports of Danzig and Memel to the League of Nations.

II. COLONIAL TERRITORY: Most of German East Africa, all of German Southwest Africa, part of Togoland, and part of Cameroon to Great Britain; remainder of Togoland and Cameroon to France; part of German East Africa to Belgium and part to Portugal; German New Guinea, Bismarck Archipelago, Solomon Islands, German Samoa, and Nauru Island to Great Britain; Kiaochow, Caroline Islands, Marshall Islands, Mariana Islands or Ladrones, and Pelew Islands to Japan.

*consult the Easy Reference Fact-Index at the end of this work*

# Denmark

DENMARK consists of the peninsula of Jutland and several islands lying at the entrance of the Baltic Sea. Although their land borders on Germany, the Danes are more closely connected by race, customs, and traditions to Sweden and Norway (3134). Denmark has few important natural resources. Coal and iron are lacking, and, despite the favorable situation, foreign commerce is difficult because the low sandy shores have few harbors that will accomodate large ships. Denmark's prosperity, therefore, is the outgrowth of the thrift and enterprise of the people, their marvelous coöperative industries, and the high degree of public education.

I. **PHYSIOGRAPHY:**
   - A. **Peninsula of Jutland: Stormy Barren West Coast and Protected Smiling East Coast 994–6.**
   - B. **Islands More Important than Peninsula: Fünen, Zealand, Laaland, Falster, Möen, and Bornholm 996.**
   - C. **Character of the Surface: Low Plains, Woodlands, and Swamps: 994–6.**
   - D. **Coastline Faces North Sea and Baltic: 2528, 321.**

II. **CLIMATE:** Denmark is exposed to cold and damp winds, which bring an abundance of moisture.

III. **NATURAL RESOURCES:** Farmland, pasture land, pottery clay, and fishing waters are the only natural sources of wealth 994, 996.

IV. **INDUSTRIES:**
   - A. **Agriculture is the Chief Industry: 994.**
     - a. **Chief Crops: Oats, Rye, Barley, Potatoes, Sugar Beets, Hay.**
     - b. **Importance of Dairying: 996, 953.**
     - c. **Effective Work of Coöperative Societies: 879, 996.**
   - B. **Fisheries: Cod, Salmon, Shrimp, Lobster, Haddock, Herring, and Flounder 994.**
   - C. **Manufacture of Porcelain: 996.**

V. **CHIEF CITIES: Copenhagen (capital) 880, Aarhus, Aalborg, and Odense 996.**

## POSSESSIONS OF DENMARK

I. **FAROE ISLANDS: 997.** These islands, lying about midway between Scotland and Iceland, are considered part of Denmark, having representatives in the Danish Legislature. Area, 540 square miles; population, about 20,000. Chief industries, fishing and sheep raising.

II. **GREENLAND: 1539.** This, the largest island in the world, is the only true colony of Denmark. Area is estimated at about 800,000 square miles, of which only 46,740 square miles are under settled government. Population (mostly Eskimos), about 14,000. Chief industries, fishing, seal hunting, trapping, and cryolite mining.

## ICELAND

**ICELAND: 1722.** This island, formerly a Danish colony, has had an independent sovereign government since 1918. It forms, however, a loose union with Denmark, the Danish king being also king of Iceland. Area, 39,709 square miles; population, about 92,000. Chief industries, fishing, stock raising, and agriculture on a small scale.

# Sweden and Norway

THE Scandinavian Peninsula, occupied by Sweden and Norway, is virtually an island in the commercial and economic sense. The neck of land which connects the peninsula to the European mainland is so remote in its arctic isolation that it has little practical value as a link with the rest of the world. It is, in fact, an almost unused back door. The front door of Sweden and Norway is the sea. By keeping this in mind, it will be easier to understand the characteristics of these two countries. Furthermore, the features which distinguish Sweden and Norway from each other can be largely traced to differences between the seas which they face. Norway, exposed to the tempering winds from the North Sea, has on the whole a warmer moister climate than Sweden, despite the fact that Sweden is farther to the south. The Baltic Sea harbors of Sweden are usually ice-locked throughout the winter, while most of the Norwegian seaports, snuggled in the deep fiords, are free the year around. While this makes Norway a more important sea-faring nation than Sweden, the excessive rains combined with the poor soil keep its agricultural development far behind that of Sweden. The two countries, however, are closely related by race and tradition. The people of the Scandinavian peninsula are vigorous and thrifty, and make excellent use of their broad political freedom. In the countries to which they emigrate they become as a rule valuable and prosperous citizens.

## SWEDEN

I. **PHYSIOGRAPHY: See map on page 2531.**
   - A. **Separated from Norway by Kiolen Mountains: 3402.**
   - B. **Divided into Three Natural Regions:**
     - a. **Götaland, a Fertile Region in the Extreme South: 3402–3.**
     - b. **Svealand, a Middle Region of Lakes and Hills: 3402.**
     - c. **Norrland, a Northern Region of Vast Forest-Covered Mountains: 3403.**
       —Includes part of Lapland: 1962.

C. Coastline is Irregular, Rocky in Places, Sandy in Others: 3402, 321.
—Part of southern coast faces the Kattegat branch of the North Sea: 2528.

II. CLIMATE: 3401. Summers in Sweden are short, winters are long. The extremes of temperature are greater than in Norway. The mountains also cut off much of the moisture carried on the winds from the North Sea.

III. NATURAL RESOURCES:
- A. Fertile Soil in the South: 3402–3.
- B. Fish Plentiful in Baltic and Inland Waters: 3402, 3404.
- C. Forests and Mineral Deposits: 3404.
- D. Navigable Rivers and Water Power: 3404.

IV. INDUSTRIES:
- A. Agriculture is the Most Important Industry: 3404. Chief Crops are Oats, Rye, Barley, Potatoes, and Sugar Beets.
- B. Lumbering and Mining (Iron, Copper, Silver, and Zinc): 3404.
- C. Fisheries: 1285, 3402.
- D. Manufacturing: 3404. Chief Products are Matches, Furniture, Wood Pulp, Paper, Porcelain, Glass, Textiles, Iron and Steel Products, and Sugar.
- E. Transportation—Railroads, Rivers, Canals, and Shipping: 3403–4, 3219.

V. CHIEF CITIES: Stockholm (capital) 3357: Göteborg, Malmö, Norrköping, and Helsingborg 3403.

## NORWAY

I. PHYSIOGRAPHY:
- A. Separated from Sweden by the Kiolen Mountains: 2529, 2532.
- B. Nearly All Norway Covered with Rugged Mountains and Plateaus: 2529, 2532.
  - a. Effect of Ancient Glaciers on the Surface: 2788, 2529.
  - b. Vast Size of Modern Glaciers: 2532.
- C. Coastline Broken by Countless Fiords and Bordered with Small Islands: 2529–30, 2532, 2534 and 2789 (pictures).
- D. The North Sea and the Skagerrack: 2528.
- E. Spitzbergen Islands: 2534, 189 (map).

II. CLIMATE: 2530. The temperate ocean winds and the effect of the Gulf Stream (1549) help to make the climate of Norway milder than that of Sweden and the lands farther east. The winters, however, are long and the summers short. The northern third of Norway lies inside the Arctic circle.

III. NATURAL RESOURCES:
- A. Great Forests of Pine and Fir: 2532, 2536.
- B. Inexhaustible Supply of Fish in Coastal Waters: 2536.
- C. Some Mineral Deposits (Iron, Copper, Nickel, and Silver): 2536.
  —Immense Coal Deposits on Spitzbergen Islands: 2534.
- D. Agricultural Land Confined to Small Valleys: 2530.
- E. Water-Power: 2536; Countless Natural Harbors: 2532.

IV. INDUSTRIES:
- A. Fisheries—Cod, Herring, Mackerel, Salmon, Whale: 2536, 2532–4.
- B. Lumbering and Lumber Products: 2532, 2536.
- C. Agriculture on a Small Scale—Oats, Rye, Barley, Potatoes: 2534.
- D. Stock Raising and Dairying: 2534.
  —Reindeer are raised in the extreme north: 2993, 1962, 2534.
- E. Manufacturing—Chemicals, Machinery, and Woodenware: 2536.
- F. Transportation: 2536. Norway is one of the important shipping countries of the world (3219).

V. CHIEF CITIES: Christiania (capital) 758; Bergen, Trondhjem, and Stavanger 2532; Narvik 2534; Hammerfest 2534, 2536 (picture).

# Finland, Esthonia, Latvia, and Lithuania

THESE four states, bordering upon the Baltic, were before the World War parts of Russia. Each declared its independence during the disorders which followed the Russian Revolution and the separate peace treaty with Germany. Since that time, these states have been supported in their independence by the western powers. The Letts of Latvia and the Lithuanians belong to an ancient Baltic race more nearly related to the old Prussians than to the Russian Slavs. The Esths of Esthonia and the Finns are descended from a western branch of the Mongolian or yellow race (3867–8). In many respects the peoples of these small countries have retained racial characteristics and traditions which set each of them apart from its neighbors.

I. FINLAND: 1248.
- A. Physiography: A country of low hills and countless lakes in the south and center, with the Manselka Mountains rising in the extreme north.
- B. Climate: Long cold winters and short hot summers prevail, the climate on the whole resembling that of Sweden.

C. **Resources and Products:** Valuable timber and timber products; grazing land and dairy products; mining and quarrying (copper, iron, and granite); water-power.
D. **Area, about 128,000 square miles; Population, about 3,150,000.**
E. **Capital and Chief City: Helsingfors 1248.**

Note: The Aland Islands (1248) at the mouth of the Gulf of Bothnia were assigned to Finland by the League of Nations, after the conflicting claims of Sweden and Finland had been considered.

II. **ESTHONIA: 1180.**
A. **Physiography:** Low flat land with numerous lakes, rivers, and swamps.
B. **Climate:** Long cold winters and hot summers.
C. **Resources and Products:** Agriculture (rye, wheat, barley, and potatoes); live stock (sheep, cattle, hogs, and horses).
D. **Area, about 20,000 square miles; Population, about 1,400,000.**
E. **Capital and Chief City: Reval 1180.**

III. **LATVIA: 1969.**
A. **Physiography:** Wooded hills and valleys and low marshes; Duna or Dvina River flows across Latvia and empties into Gulf of Riga (3020).
B. **Climate:** Similar to that of Esthonia.
C. **Resources and Products:** Agriculture (rye, oats, barley, flax, and potatoes); timber and timber products; water-power from Duna River.
D. **Area, about 20,000 square miles; Population, about 1,500,000.**
E. **Capital and Chief City: Riga 3019.**

IV. **LITHUANIA: 2030.**
A. **Physiography:** Plains, forest lands, and marshes; Niemen River on southern boundary.
B. **Climate:** Similar to that of Esthonia and Latvia.
C. **Resources and Products:** Timber and timber products; stock raising and dairy products (cattle, poultry, butter and eggs, hides and wool); agriculture (rye, oats, barley, wheat, potatoes, and flax).
D. **Area, about 19,000 square miles; Population, about 2,500,000.**
E. **Capital and Chief City: Kovno** (Vilna, the largest city in Lithuania is claimed by Poland; Memel, the chief seaport, is still under the control of the Allied Powers).

# Poland

THE lack of natural boundaries has been in great measure responsible for the historic misfortunes of Poland and for many of its present problems. From its earliest existence as a separate nation, Poland was constantly involved in disputes with its neighbors over this or that piece of territory, and the area of the country waxed and waned in accord with the power or weakness of its rulers. Lying in the middle of the Great European Plain at the crossroads of commerce between the north and the south, the east and the west, Poland has always been a storm center of international politics. Its location at the meeting point of diverse racial groups—Germanic, Scandinavian, Slavic, and Mongolian peoples — has been a further cause for unrest and dissension. All these things culminated in the complete overthrow of Polish sovereignty and the partition of Polish territory between Russia, Germany, and Austria in the years 1772, 1793, and 1795. As a result of the World War, however, Poland was restored as an independent nation. But the old problems, economic as well as political and social, remain to a great degree, and must be kept in mind while studying Poland's modern geographical status and the part this reëstablished nation plays in international affairs.

I. **PHYSIOGRAPHY: 2857.**
A. **Part of Great Central Lowland of Europe: 1190–1.**
B. **Much of Land is Marshy and Dotted with Lakes: 2857.**
C. **Carpathian Mountains on Southern Boundary: 646.**
D. **Vistula River and Its Tributaries Drain Most of Poland: 3651.**
E. **Poland Has Short Coastline on Baltic in Northwest: 2856.**

II. **CLIMATE: 2857.** Winters are long; springs are rainy; summers are dry and often extremely hot. The first suggestions of Russia's "continental" climate (3086) begin to show themselves here.

III. **RESOURCES AND PRODUCTS: 2857.**
A. **Agriculture: Rye, Oats, Wheat, Barley, Sugar Beets, Potatoes, Hemp, and Hops.**
B. **Minerals and Mining: Coal, Iron, Zinc, Tin, Copper, and Sulphur.**
C. **Manufacturing: Textiles, Leather and Leather Goods, Lumber and Wood Products, Metal Products, Beet Sugar.**

IV. **CHIEF CITIES: Warsaw** (capital) **3673; Lodz 2857; Lemberg 2857; Cracow 914.**

**FREE CITY OF DANZIG: 962.** This important seaport and the surrounding territory, lying across the mouth of the Vistula River between Poland and East Prussia, was claimed by Poland after the World War as necessary to its commercial development. The population, however, is almost entirely German. To protect the rights of the Danzig citizens as well as the commerce of Poland, it was set up as an independent commonwealth under the protection of the League of Nations. **Area of Danzig and attached territory, 729 square miles; population, 351,000.** Besides its shipping interests, Danzig has many manufacturing industries.

# Austria, Czecho-Slovakia, Hungary, Rumania

THESE four countries are called for convenience the Central European States. The first three came into separate existence as a result of the World War, having formerly been a part of the empire of Austria-Hungary. With Switzerland, they are the only important European states which have no outlet to the sea. This, as well as their mutual proximity and their joint history, makes it advisable to consider these three countries in a group. Rumania, with its front door upon the Black Sea, is not so closely related to the other Central European States. Politically, it has figured more prominently in the affairs of Russia and the Balkan States. Yet the natural resources of Rumania and its economic problems are very much the same as those of Hungary, Czecho-Slovakia, and Austria. All four countries lie, in whole or in part, in the great Danube Basin. Controlling the Central Mountains and Highlands which surround the Hungarian Plain, they thus control many of the most important avenues of commerce between northern and southern Europe. With friendly coöperation, they can develop their vast natural resources to the great advantage of all the regions involved. The greatest obstacle to such united effort is the extraordinary diversity of the population of these four nations. The Austrians are mostly of German Stock. The inhabitants of Czecho-Slovakia belong to the Bohemian (Czech) and the Slovak branches of the Slavic family. The majority of the people of Hungary are Magyars, that is descendants from early invaders of the Mongolian or Yellow race. The Rumanians are believed to be, in part at least, of Latin origin, with mixtures of Slavic blood. With each racial group having its own language, traditions, and strongly developed national aspirations, Central Europe is beset with many great problems in the adjustment of conflicting claims and interests.

I. AUSTRIA: 269, 270.
- A. Physiography:
  - a. Alps in Western, Central, and Southern Austria: 101–2, 270, 3573.
  - b. Moravian Hills in the North: 270.
  - c. Valley of Danube between the Highlands: 961, 270.
  - d. Strip of Hungarian Plain in the East: 269, 271.
- B. Climate: The varying altitude of Austria produces a varied climate. The rainfall is heavy, particularly in the mountain districts.
- C. Resources and Products: 269.
  - a. Agriculture is the Chief Industry: Wheat, Rye, Barley, Oats, Potatoes, and Turnips.
  - b. Timber and Timber Products.
  - c. Minerals and Mining: Iron, Lignite Coal, Copper, Zinc, and Lead.
  - d. Manufacturing: Textiles, Automobiles, Pianos.
- D. Area, about 32,000 square miles; Population, about 6,500,000.
- E. Chief Cities: Vienna (capital) 3641; Grätz (see Fact-Index).

II. CZECHO-SLOVAKIA: 947. Made up of the former Austrian provinces of Bohemia (447), Moravia, Slovakia, and Ruthenia (948).
- A. Physiography:
  - a. Mountains and Highlands: Moravian Hills 270; Bohemian Forest (Böhmer Wald), Ore Mountains (Erzgebirge), and Giant Mountains (Riesengebirge of Sudetic Chain) 270, 1107, 447; Carpathian Mountains 646.
  - b. Rivers: Headwaters of Elbe 1107; Danube on Southern Boundary and Tributaries of Danube in the East 961.
- B. Climate: Abundant rainfall; cold winters and hot summers.
- C. Resources and Products: 947.
  - a. Timber and Timber Products: 646–7.
  - b. Agriculture: Wheat, Rye, Barley, Oats, Potatoes, Beets, Hops.
  - c. Minerals and Mining: Coal, Iron, Graphite, Gold, Silver, Copper, Lead 947, 647.
  - d. Manufacturing: Textiles, Glass, Furniture, Machinery, Paper, Chemicals, Beet Sugar, and Beer, 270.
- D. Area, about 54,700 square miles; Population, about 13,600,000.
- E. Capital and Chief City: Prague 2911.

III. HUNGARY: 1702, 271.
- A. Physiography:
  - a. Slopes of Carpathians Form Northern Boundary: 646.
  - b. Great Hungarian Plain (Alföld) Covers Remainder of Hungary and Extends Eastward into Rumania and Southward into Jugo-Slavia: 271, 1702, 1190.
  - c. Chief Rivers: Danube Flowing across Central Hungary 961; Theiss (or Tisza) in the East 962, 1702; Drave on the Southern Boundary 962, 1703.
- B. Climate: Hungarian Plain has less moisture than surrounding highlands, but rainfall is most abundant in the late spring which favors the early growth of crops, while the late summer is hot and dry, which helps the crops to ripen; the winters are extremely cold.
- C. Resources and Products: 1702–3, 271.
  - a. Agriculture: The Hungarian Plain is the richest agricultural region in Europe.
    —Chief Crops: Wheat, Rye, Barley, Oats, Corn, Sugar Beets, Hops, Grapes, Tobacco, Flax.

b. Stock Growing and Dairying.
c. Minerals and Mining: Coal and Iron.

D. Area, about 36,500 square miles; Population, about 7,850,000.
E. Chief Cities: Budapest (capital) 524; Szegedin (see Fact-Index).

IV. RUMANIA: 3080.
A. Physiography: See map, page 308.
a. Mountains: Southern Spurs of Carpathian Mountains Including Transylvanian Alps 646, 3081.
b. Uplands of Transylvania West of Mountains: 3081.
c. Strip of Hungarian Plain on Western Border.
d. Lowland Plain in East and South Comprising Lower Danube Basin and Stretching to Black Sea: 3081. This is the southwestern tip of the Russian Plain, which forms a part of the Great Central Lowland of Europe (1190–1).
e. Rivers: Danube (961) and Its Tributaries the Pruth and Sereth (308 map); Dniester on Northern Boundary (see Fact-Index).
B. Climate: Mountains and western slopes have typical Central European climate; eastern plains suffer from extremes of heat and cold (3081).
C. Resources and Products: 3081.
a. Agriculture: Wheat, Rye, Barley, Oats, Corn, Beans, Potatoes, Sugar Beets, Tobacco, Grapes, and Fruit.
b. Timber and Timber Products: 3081–2.
c. Minerals and Mining: Coal, Salt, Silver, Iron, Lead, Copper, and Marble.
d. Important Oil Fields: 2755, 3081 (picture).
D. Area, about 122,000 square miles; Population, about 17,400,000.
E. Chief Cities: Bucharest (capital) 523; Kishinef (see Fact-Index); Jassy, Constantza, 3082.

LIECHTENSTEIN: 1194, see also Fact-Index. This principality, lying between Austria and Switzerland and formerly dependent upon Austria-Hungary, was given its independence in 1918. Area, 65 square miles; population, about 11,000; chief products—grain, wine, fruit, timber, and live stock.

# Spain and Portugal

WHY is it that Spain and Portugal, with their wealth of minerals, their favorable situation for ocean commerce, and their past traditions of power and prosperity, are today so thinly populated and so backward in their commercial development? This is not the place to discuss the historical causes of the decline of Spain and Portugal, the loss of their colonies which once included all of South America, or their relapse into a secondary place in international affairs. But a partial answer to the problem may be found in the geographical conditions which prevail in these countries. The Iberian Peninsula, upon which Spain and Portugal are situated, is almost as much isolated from the rest of Europe as though it were an island. The formidable wall of the Pyrenees bars the only approach by land. The coastline (see map on page 3300) has very few natural harbors large enough to accommodate modern ships, and most of the rivers are rushing mountain streams unfit for navigation. The interior of the country consists chiefly of a high rough plateau, criss-crossed by ridges which interfere with transportation from one part of the peninsula to the other. Furthermore, the climate and soil of this interior plateau are not favorable to agriculture on a large scale. In former days when commercial and industrial life was equally simple everywhere, Spain and Portugal were able to keep pace with their neighbors, but in the modern economic struggle these many natural obstacles have been a serious block to progress. The future prosperity of the peninsula depends to a great extent upon the development of the immense mineral resources of these rugged mountains and upon the establishment of industries to make use of the raw materials so obtained. Of the two countries, Portugal has the more favorable climate and soil.

I. SPAIN: 3299.
A. Physiography:
a. Mountains: Pyrenees 2940; Cantabrian Mountains, Sierra Nevada, Sierra Morena 3299 (table), 3300 (map).
b. Central Table-Land or Plateau: 3300.
c. Lowland Plains: 3299. These include the valley of the Ebro (3300 map), a narrow strip on the Gulf of Valencia (3302), and the valley of the Guadalquivir broadening out on the Gulf of Cadiz (3300 map).
d. Guadalquivir (3182) and Ebro (see Fact-Index) are the Only Navigable Streams.
e. Smooth Coastline with Few Natural Harbors: 3299.
f. Balearic Islands off the East Coast: 307.
B. Climate: 3300, 3301, 3302. The rainfall on the Atlantic Coast is extremely heavy; it is lighter on the Mediterranean coast; and in many parts of the mountain-ringed interior, semi-desert conditions prevail. Extremes of heat and cold exist in the interior, but on the coast the temperature is usually milder.

C. Resources and Products: 3300–2, 2940.
   a. Agriculture: Wheat, Barley, Oats, Rye, Corn, Beans, Peas, Sugar Beets, Grapes, Olives (2579), Oranges (2590), Lemons (1985), Flax, and Hemp.
      —Importance of Irrigation: 3302, 3614.
   b. Stock Raising: Sheep, Goats, Hogs, Poultry, Cattle, Horses, Mules, and Asses.
   c. Minerals and Mining: Coal, Iron (1820), Lead, Copper, Mercury (2200, 3302), Zinc, Sulphur, Silver (3242), Potash (2900).
   d. Fisheries: Sardines 3126; Tunny 3552.
   e. Manufacturing: Cotton Goods, Woolens, Silk, Wine, Leather, Paper, Glass, Cork, Lumber.
   f. Supply of Water-Power is Large but Undeveloped: 3302.

D. Chief Cities: Madrid (capital) 2110; Barcelona 329; Valencia 3614; Seville 3181.

E. Spanish Possessions: Canary Islands 628; Rio de Oro and Rio Muni on West Coast of Africa (see Fact-Index).

II. PORTUGAL: 2888.

A. Physiography: The physiography of Portugal is generally similar to that of Spain, except that its mountain ranges are smaller. It is made up of a continuation of the great Iberian plateau, with several small lowland areas on the coast. Its principal rivers are the Douro (2888) and the Tagus (2026), both navigable.

B. Climate: Being more exposed to the tempering winds of the Atlantic, Portugal has on the whole a milder and moister climate than Spain.

C. Resources and Products: 2888–9.
   a. Agriculture: Wheat, Corn, Oats, Rye, Barley, Grapes, Olives, Figs, Tomatoes, Oranges, Onions, and Potatoes.
   b. Stock Raising: Sheep, Goats, Cattle, Hogs.
   c. Forests: Lumber and Cork (887) are Among the Chief Sources of Wealth.
   d. Minerals: Tungsten (3548), Iron, Copper, Manganese, Lead, Tin, and Gold.
   e. Fisheries: Sardines 3126; Tunny 3552.
   f. Manufacturing: Wine, Chemicals, Leather, Olive Oil, Woolens, Cotton Goods, Lace, Porcelain Tiles.

D. Chief Cities: Lisbon (capital) 2026: Oporto 2888.

E. Portuguese Possessions:
   a. Atlantic Islands: Azores 288; Madeira 2106; Cape Verde Islands 641; St. Thomas and Principe (see Fact-Index).
   b. African Colonies: Portuguese Guinea, Angola, and Mozambique (see Fact-Index).
   c. Asiatic and East Indian Colonies: Portuguese India (including Gôa, Damao, and Diu) 1756; Macao (see Fact-Index); part of Timor Island (see Fact-Index).

ANDORRA: 1194, see also Fact-Index. This tiny semi-independent republic lies in the Pyrenees between Spain and France. Area, 191 square miles; population, 5000.

# Italy

ITALY, with its commanding position in the Mediterranean Sea, dominated the world in the days when the Mediterranean was the center of civilization. After the break-up of the Roman Empire, Italy retained its leadership in culture and continued to be prosperous, despite the fact that political supremacy passed to northern Europe. So great was the natural wealth of this fertile peninsula and so versatile the genius of its people, that it became in the Middle Ages and later the home of numerous city-states and principalities, many of which continued to thrive despite intrigue, civil war, and foreign invasions until Italy became a unified nation in the 19th century. The commercial advantages which Italy owes to its position along the highways of trade between Europe, Africa, and Asia promise to become increasingly important as the resources of the near-East and the north African lands are more fully developed.

I. PHYSIOGRAPHY:

A. Mountains: 1835.
   a. Alps along the Northern Boundary: 101.
   b. Apennines Form Backbone of Peninsula: 154.
      1. Highlands of Sicily (3229) are part of same land formation as the Apennines.
      2. Volcanoes: Vesuvius 3635; Etna 1185.

B. Lowlands: 1835, 2047, 2848. These include the plains of Lombardy and the valley of the Po, the plains of Tuscany, the Roman Campagna, and other coastal plains along the Mediterranean Sea (2193) and the Adriatic Sea (26).

C. Chief Rivers: Po River 2848; Tiber 3494; Adige and Arno 1835 (see also Fact-Index).

D. Principal Lakes: Maggiore 1835 (picture); Como 1841 (picture).

E. Islands: Sicily 3229; Sardinia 3126.

II. CLIMATE: 1835. The Alps cut off the cold winds from the north, making the valleys on the Italian side warmer than those on the other slope. The summers are hot throughout the entire peninsula. Except in the higher mountain regions, the winters become increasingly mild toward the south. Rainfall is usually plentiful in all parts of Italy.

III. NATURAL RESOURCES:
- A. Rich Soil and Forests: **1838–9, 1190, 2047, 3126.**
- B. Minerals: With the exception of Marble (2144, 154), the mainland of Italy contains little mineral wealth. However, Sardinia (3126) provides many metals, principally Iron, Zinc, and Lead· and Sicily yields Sulphur (3230, 3389).
- C. Water-Power: **1838; Fish and Other Water Products 2194, 2848.**

IV. INDUSTRIES: **1838–9, 1840–1, 3230, 3126.**
- A. Agriculture: Wheat, Corn, Potatoes, Sugar Beets, Grapes, Olives, Oats, Beans, Rice, Barley, Rye, Lemons, Oranges, and Tomatoes.
- B. Stock Raising: Sheep, Cattle, Goats, Hogs, Horses, Mules, and Asses.
- C. Mining and Quarrying: Sulphur, Marble, Iron, Zinc, Lead, Mercury, and Manganese.
- D. Fisheries: Tunny 3552; Sardines 3126; Coral 886.
- E. Manufacturing: Silk, Cotton Goods, Wines, Olive Oil, Hemp, Hats, Rubber Goods, Leather, Automobiles, Glass, Paper, Chemicals, Sugar, Macaroni, and Soap.

V. CHIEF CITIES: Naples 2390; Milan 2235; Rome (capital) 3049; Turin 3555; Palermo (see Fact-Index); Genoa 1412; Florence 1293; Trieste 3540; Catania (see Fact-Index); Bologna 450; Venice 3623; Ravenna 2979; Pisa 2810; Trent 3539.

VI. ITALIAN POSSESSIONS: Tripoli or Libya 3541; Eritrea and Italian Somaliland (see Fact-Index); the Island of Rhodes 3010.

SAN MARINO: **1842.** This is a small independent republic completely surrounded by Italian territory.

FIUME: **1286.** After a dispute in 1920 between Italy and Jugo-Slavia over this important seaport, it was made into a separate state. Area, about 8 square miles; population, about 48,000.

# Jugo-Slavia, Bulgaria, Albania, Greece

OCCUPYING, as they do, the Balkan Peninsula (307) and adjacent territory, these four countries are known as the Balkan States. The history of this corner of Europe has been one of disorder, strife, intrigue, and confusion. After more than three hundred years spent under the yoke of the Turks, the Balkan peoples began to gain their freedom about a century ago, only to become involved in a series of wars, during which the jealousies and rivalries of the greater powers were aroused, culminating directly in the world disaster of 1914–1918. Much of this tragic course of events can be explained in geographical terms. Lying on the pathway between Europe and Asia, and between the Mediterranean lands and the great plains to the northeast, this region has been overrun by invaders of widely varying races ever since the dawn of history. Each left a separate heritage in the population. The numerous small mountain ranges which cut up the surface of the peninsula as well as the many separate outlets to the sea tended to keep this population divided into small independent groups, each with its own customs, dialect, and ambitions. The long Turkish rule not only failed to unite the interests of these people, but actually held back their civilization at the very time when the rest of Europe was learning the lesson of modern organization and government. The rapid development of the commerce of the near-East places the Balkan States today in a position of critical importance, and the many phases of the "Balkan question" are among the most delicate of international affairs.

I. JUGO-SLAVIA: **1901.** This state, newly-created after the World War, consists of what formerly was **Serbia (3176), Montenegro (2313), Bosnia and Herzegovina (468),** and other lands on the Adriatic previously belonging to Austria-Hungary, including **Croatia and Slavonia (271),** and most of **Dalmatia (1286).** The northern boundary extends into the **Hungarian Plain (1702).**
- A. Physiography: **1902, 2313, 307, 308 (map).**
  - a. Mountains: All of Jugo-Slavia, except the northern strip of Hungarian plain is covered with rugged forested highlands and mountains including the **Dinaric Alps,** which form a link between the Alps proper in the west and the Balkan ranges in the east (1190).
  - b. Lowlands: The strip of **Hungarian Plain** includes the valleys of the **Save** and the **Drave** and a rich part of the **Danube Valley (962).**
- B. Climate: The climate, particularly on the southern mountain slopes, is mild. Extremes of cold are found only in the highest interior ranges. Rainfall is plentiful along the coast and in the foothills to the north, but scanty in some of the enclosed table-lands.
- C. Resources and Products: **1902, 3177, 468.**
  - a. Agriculture: Wheat, Barley, Oats, Corn, Potatoes, Grapes, Rye, Sugar Beets, Hops, Tobacco, Fruits (particularly Plums), and Hay.
  - b. Stock Raising: Sheep, Goats, and Cattle.
  - c. Minerals and Mining: Coal, Iron, Copper, Lead, Zinc, Antimony, Manganese, Mercury, Gold, Silver, and Cement.
  - d. Manufacturing: Flour, Beer, Silk, Wines, Leather, Textiles, Carpets, Meat-Packing, Pottery, Iron Products, and Lumber.
- D. Area, about 95,000 square miles; population, about 11,000,000.
- E. Chief Cities: Belgrade (capital) 376; Agram or Zagreb (see Fact-Index).

II. BULGARIA: 532.
- A. Physiography: 532–3, 307. The **Balkan Mountains** lie across the middle of Rumania from west to east. To the north is a lowland plain extending to the boundary which is mostly formed by the **Danube River (962)**. South of the Balkan Mountains are highlands surrounding a strip of plain which extends to the Black Sea (434).
- B. Climate: Generally mild with cold winters in the mountains of the interior.
- C. Resources and Products: 533.
  - a. Agriculture: Wheat, Corn, Barley, Rye, Tobacco, Grapes, and Fruit.
  - b. Stock Raising: Sheep, Cattle, and Goats.
  - c. Minerals and Mining: Coal, Iron, Gold, Silver, Lead, Manganese, and Copper.
  - d. Manufacturing: Foodstuffs, Leather, Perfumes.
- D. Area, about 40,000 square miles; Population, about 4,500,000.
- E. Chief Cities: Sofia (capital) 3272; Philippopolis (see Fact-Index).

III. ALBANIA: 79.
- A. Physiography: 79. Rugged mountains encircle a narrow strip of coastal plain on the Adriatic.
- B. Climate: Extremely mild, except in the highest mountain regions where the winters are quite severe.
- C. Resources and Products:
  - a. Agriculture: Wheat, Corn, Tobacco, Olives.
  - b. Stock Raising: Sheep, Goats, and Cattle.
  - c. Minerals: Coal, Copper, Silver, Gold, and Lead.
  - d. Manufacturing: Except olive oil and cloth for home use, there are no manufactures of importance in Albania.
- D. Area, about 11,000 square miles; Population, about 850,000.
- E. Chief Cities: Durazzo (capital) and Scutari (see Fact-Index).

IV. GREECE: 1517.
- A. Physiography:
  - a. Mountains and Plains: 1517. All of Greece is criss-crossed by ranges of low mountains and hills, with small valleys and plains between. The **Pindus range (307)** extending down from the northwest border is the most important of the mountain systems.
  - b. Coastline: 1517. Marked by countless gulfs and peninsulas, among which the most important are the **Gulf of Corinth (886)** and the **Peninsula of Morea (1517)**.
  - c. Surrounding Islands: Crete 918; Aegean Islands (Sporades and Cyclades) 1520, 308 (map); Ionian Islands 308 (map).
- B. Climate: 1518. Temperate, with moist winters and dry summers.
- C. Resources and Products: 1517–8, 1528, 918.
  - a. Agriculture: Wheat, Corn, Barley, Grapes, Currants, Olives, Oats, Tobacco, Cotton, Oranges, Lemons, Rice, Figs, and Nuts.
  - b. Stock Raising and Dairy Products: Sheep, Cattle, Cheese.
  - c. Minerals and Mining: Greece is poor in minerals particularly Coal; the most important are Iron and Zinc.
  - d. Manufacturing: Olive Oil, Wines, Textiles, Leather, Soap, Glass, and Paper.
  - e. Shipbuilding and Sea Commerce are Important: 1528.
- D. Area, about 57,400 square miles; Population, about 6,300,000.
- E. Chief Cities: Athens (capital) 249; Saloniki 3114; Piraeus (port of Athens) 249; Adrianople 26.

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TURKEY IN EUROPE: Of its former possessions in Europe, Turkey retains control only of **Constantinople (871)** and a small surrounding area, totaling in all about 1200 square miles. On each side of the **Bosporus (468)**, of the Sea of Marmora, and of the **Dardanelles (963)**, territory has been set aside, called the **"Zone of the Straits,"** under the control of an Inter-Allied Commission.

# Russia

RUSSIA, the last of the European states to come under the influence of western civilization, still remains almost a stranger among the others. Indeed, Russia belongs as much to Asia as it does to Europe. The ambitions of its former rulers led them to seek a place in the affairs of the western powers, but fundamentally Russia continued to be a nation apart. When the revolution of 1917 overthrew the czar and the whole structure of the imperial government, the bonds with western Europe were broken, and Russia retired within itself, faced with the enormous problem of rebuilding a government from the very foundation upward. The mass of the Russian people, made up of varying types of Slavs, mingled with Tatars, Mongols, and numerous other stocks, had little spirit of unity and no experience with the broad problems of self-government. Yet the radical Bolshevist leaders (450, 3095) who had taken control chose this moment for launching an experiment in mass-rule such as had never before been attempted. What the ultimate result of this experiment will be, it is impossible to forecast. Disorder, anarchy, famine, and the tyranny of dictators marked the opening days of Bolshevism. Other great nations either held aloof or opposed the new régime. But Russia is such a vast country with such enormous natural resources that under proper management it has the power to stand alone. Whether

a government founded on Bolshevist principles can work out its great economic problems remains to be seen. This Outline deals only with European Russia. The far larger but less densely populated regions of Asiatic Russia are treated in the Outline on Asia.

I. PHYSIOGRAPHY:
- A. Most of Russia is a Great Lowland Plain: **3085, 3086, 1190–1.**
  - a. The Fertile "Black Belt": **3575, 3086.**
  - b. Steppes or Prairie Lands and Barren Tundras: **1190–1, 3084, 3086.**
- B. Mountains:
  - a. Low Chain of Ural Mountains on Eastern Boundary of Europe: **3606, 1190.**
  - b. Rugged Caucasus Mountains on Southern Boundary: **663, 1190, 3091** (picture).
- C. Rivers, Lakes, and Inland Seas: **3085, 1188, 434, 654, 3575.**
  - a. Volga River, the Largest Stream in Europe: **3660.**
  - b. Lake Ladoga, the Largest Lake in Europe: **1955.**
  - c. Black Sea: **434**; Caspian Sea: **654.**

II. CLIMATE: **3086, 2973.** The great interior plains of Russia have much the same climate as the North American plains, namely a wide variation in temperature between winter and summer, dry winds, and uncertain rainfall Like the North American plains, also, the Russian plains extend from the frozen Arctic Zone to the temperate regions of the south.

III. RESOURCES AND PRODUCTS:
- A. Agriculture and Stock Raising: **3086, 922.**
  - a. Great Areas of Extremely Fertile Soil: **3086, 3575.**
  - b. Chief Crops: Wheat **(3732)**, Rye, Oats, Barley, Potatoes, Flax **(1292)**, Hemp, Sugar Beets, Tobacco, and Rice.
  - c. Live Stock: Sheep, Cattle, Horses, Hogs.
- B. Forests and Timber Products: **3086, 3607.**
  —Lumber, Wood Pulp, Tar, Turpentine, and Resin.
- C. Fish and Fisheries: **3086, 654.** Chief products of Fisheries are Salmon and Sturgeon **(3374)**, the latter yielding Caviar and Isinglass.
- D. Minerals and Mining: **3086–7, 3575, 654, 664, 3606.**
  - a. Russia is the Chief Source of Platinum: **2831.**
  - b. Other Minerals: Coal, Petroleum, Iron, Manganese, Cobalt, Sulphur, Mercury or Quicksilver, Copper, Zinc, Gold, Silver, Iridium, and Precious Stones.
- E. Manufacturing: **3086, 922.** Among the principal manufactures in normal times are Iron Products, Machinery, Cement, Textiles, Chemicals, Paper, Sugar, and Shoes.

IV. TRADE AND TRANSPORTATION:
- A. Access to Ocean Highways is Difficult: **3085.**
- B. River and Canal Transportation: **3085–6, 3660, 1955.**
- C. Importance of Black Sea and Caspian: **434, 654.**
- D. Railroads: There are about 30,000 miles of railway in operation in European Russia.

V. DIVISIONS OF RUSSIA: The old Russian Empire has fallen into many divisions, of which some are completely independent, others more or less closely bound to the Russian Soviet Republic. Finland, Esthonia, Latvia, Lithuania, and Poland are among the independent states, and are treated in a separate Outline (3907–8). The Republic of Ukraine **(3575)** is largely controlled by the Russian Soviet and has been treated in this Outline as a definite part of Russia. The same is true of Crimea **(921)**. The Caucasian Soviet Republics of Georgia **(1434)**, Azerbaijan (see Fact-Index), and Armenia **(211)**, lying partly in Europe and partly in Asia, are treated under Asiatic Russia.

VI. CHIEF CITIES OF EUROPEAN RUSSIA: Petrograd **2747**; Moscow (capital) **2330**; Odessa **2560**; Kief **1922**; Astrakhan **237.**

# AFRICA

AFRICA is the second in size of the continents, ranking next to Asia. It has been known to civilized people ever since the days of the ancient Egyptians. Yet it is today the most backward in civilization. Several important geographical causes contributed to retard the exploration and development of Africa. Across the northern half lies the Sahara, the largest desert in the world, which cut off the ancient seats of civilization on the Mediterranean from the African interior. The coast of Africa contains very few natural harbors, and the coastal plains are narrow, usually walled off from the great interior tableland by chains of hills or rugged mountains. Few rivers break through this encircling wall, and of these only a bare half-dozen are navigable even to small craft. But if the approach to Africa was difficult, the obstacles encountered upon landing were even more formidable. By far the greater part of the continent lies in the tropics, and in addition to the oppressive heat, a host of tropical diseases beset the white man. The negro population of the interior lived in a state of primitive savagery. There was no ready-made civilization or organization in states such as existed in Asia with which white men could deal, or upon which they could build. They had not only to fight the natives for a foothold, but to bring peace between the countless warring

tribes, and teach the reluctant tribesmen their first lesson in government. Territorial rivalries between the European nations themselves further complicated the problem, so that the task of developing the natural wealth of the Dark Continent for the benefit of our civilization has only just commenced.

I. POSITION AND AREA:
- A. Africa extends an equal distance north and south of the Equator. Thus the temperate region in the extreme north is matched by a temperate region in the extreme south; the Sahara Desert has a smaller counterpart in the Kalahari Desert; the Sudan grasslands of the north are repeated in the South African prairie belt; while in the center the Equator splits the tropical forest in two.
- B. With its area of 11,262,000 square miles, Africa is about three times as large as Europe and contains one-fifth of all the land surface of the globe.

II. PHYSIOGRAPHY: See map facing page 40.
- A. The Great Mass of Africa Consists of a High Table-land Surrounded by Narrow Coastal Plains: 33.
- B. Former Land Connection with Europe and Asia: 3299, 2106.
- C. Mountains and Highlands: Most of the higher mountain ranges are on or near the sea coast.
  - a. Atlas Mountains in the Northwest: 33, 2328, 97.
  - b. Highlands of the East: These include the Table-land of Nubia (2986), the Abyssinian Mountains (3, 2986), and the East African Ranges (34, 36, 1069 map). The latter, mostly of volcanic origin, contain Kilimanjaro, the highest peak on the continent, the "Great Rift Valley," and Ruwenzori Mountain.
  - c. South African Highlands: 36, 3279, 3282 (map).
- D. Lowlands: Congo Lowland 858–9: Narrow Coastal Lowlands 33.
- E. Forests, Grasslands, and Deserts:
  - a. Great Forests of Central Africa: 34, 858.
  - b. Savanna Region of the Sudan North of the Great Forest: 34, 3384.
  - c. Veldt Region to the South: 34, 36, 3279.
  - d. Sahara Desert, the Largest Arid Waste in the World: 3104.
    —The Libyan Desert, the Nubian Desert, and the Arabian Desert are eastern continuations of the Sahara: 3542, 1092–3, 1095 (map).
  - e. Kalahari Desert in South Africa: 36, 3280.
- F. Chief Rivers and Lakes:
  - a. Nile River, the Only Large African River Flowing into the Mediterranean: 2509.
  - b. Congo River and Its Vast Basin: 858.
  - c. Niger River: 2507; Zambezi River and Victoria Falls: 3837, 3640.
  - d. Lake Chad: 34; Victoria Nyanza 3641, 2510; Lake Tanganyika 3432; Lake Albert, Lake Albert Edward, and Lake Nyasa: 36, 1069 (map).
- G. Coastline is Unbroken—Few Natural Harbors: 33, 1578.
  —Mediterranean Coast 2194; Red Sea Coast 2986; Indian Ocean 1763; Atlantic Ocean 254; Cape of Good Hope 640.
- H. Islands off the Coast of Africa:
  - a. Madagascar, the Only Large Island: 2105, 36.
  - b. Small Islands in the Atlantic: Madeira Islands 2106; Canary Islands 628; Cape Verde Islands 641; Ascension 254; St. Helena (see Fact-Index).
  - c. Small Islands in the Indian Ocean: Zanzibar and Pemba 3837; Mauritius 2174; Comoro Islands, Reunion, and Seychelles (see Fact-Index).

III. CLIMATE: 40.
- A. Hot Equatorial Climate Modified in Places by Altitude: 34, 641, 1068.
- B. Climate of the Mediterranean Coast: 2328, 97, 1092.
- C. Desert Climate: 33, 3104, 795.
- D. Bracing Climate of South Africa: 3279, 641.
- E. Rainfall: 34, 40, 1092, see also map facing page 40.
  —Reasons for Lack of Rain in the Sahara Desert: 3104.

IV. MINERAL RESOURCES OF AFRICA:
- A. In North Africa: Petroleum 2755, 2328, 97; Copper, Antimony 2328, 97; Iron, Lead 2328, 3550, 97; Zinc 3550, 97; Sulphur, Silver, Gold 2328; Manganese, Phosphates 3550; Mercury 97.
- B. In East Africa: Coal, Iron, Lead, Copper 1069.
- C. In South Africa: Gold 41, 1479, 1895, 3283, 3527; Diamonds 1001-2, 1003 (picture), 2590, 3527; Copper 41, 881, 3527; Coal 812, 2398, 2590, 3527; Iron 3527; Tin 3504; Lead, Silver 3527.

V. VEGETABLE AND ANIMAL LIFE:
- A. Typical Vegetation of Africa: Monkey-bread Tree or Baobab 34; Mangrove 2135; Cork Oak 887; Myrtle 2385; Ebony 1073; Mahogany 2125; Cypress 946; Acacia 4; Mimosa 3174; Orange 2588; Olive 2579; Lemon Tree 3542; Tamarind 3432; Fig 97, 3542; Cycad 3533; Castor Oil Plant 657; Papaw 1378; Lotus 2063; Papyrus Plant 2674; Wild Coffee Plant 820; Elephant Grass 34; Date Palm 966; Oil Palm 2647, 1227; Bamboo Palm 323; Ground-nut 2701, 859; Banana 324.
- B. Typical Animals of Africa: Hyena 1711; Jackal 1855; Aardwolf 34; Leopard 1988; Lion 2024; Caracal 2087 (picture); Elephant 1126; Hippopotamus 1651; Rhinoceros 3006; Monkey 2291–2; Baboon and Mandrill 2292; Chimpanzee 738; Gorilla 1491; Buffalo 527; Camel 590; Giraffe, Okapi 1464; Wild Ass

236; Zebra 3838; Eland, Springbok, Gnu 146; Roan Antelope, Red Waterbuck: 147, pictures; Hartbeest 34, Wart Hog 1671, picture, 397; Wild Boar 440; Crocodile 923; Chameleon 686; Lizard 2037; Cobra 816; Horned Viper 3647; Mudfish 2363, 1272; Ostrich 2603; Whale-headed Stork 3363, picture; Secretary Bird 3171; Parrot 2690; Raven 2979; Weaver Bird 3710; Framolin and Guinea-Fowl 1548; Tsetse Fly 3546; White Ants or Termites 142.

VI. MANKIND IN AFRICA:
- A. Early Civilization in North Africa: **32.**
  - a. The Story of Ancient Egypt: **1098.**
  - b. The Phoenicians and the Founding of Carthage: **2773, 650, 3549.**
  - c. Greek Settlements in Cyrenaica: **3541.**
  - d. Roman Conquest of North Africa: **3045–6, 651, 1107, 3549.**
  - e. Early Christian Church in Africa: **3541, 3549, 3.**
  - f. Invasion and Conquest by the Vandals: **3617.**
  - g. Conquest of North Africa by the Mohammedans: **2276, 2278, 3550, 3541.**
- B. Exploration and Colonization by Whites: **36.**
  - a. Work of Prince Henry the Navigator: **1638.**
  - b. Bartholomew Diaz Discovers the Cape of Good Hope: **640, 3279.**
  - c. Vasco da Gama Sails around Africa to the Indies: **1392.**
  - d. The Dutch Settle Cape Town: **3279, 640.**
  - e. Struggle between British and Boers: **3280–2, 3526, 446.**
  - f. Two Great Explorers—David Livingstone and Henry M. Stanley: **2033, 3338.**
  - g. Cecil Rhodes—British Empire Builder: **3011.**
  - h. European Powers Divide Africa: **40.**
- C. Native Races of Africa:
  - a. Black Peoples:
    1. Negrito Types: Equatorial Pigmies 38; Bushmen and Hottentots 37, 3280.
    2. True Negro Type: 2434, 37, 35.
    3. Negroid or Bantu Type: 37, 2434, 38 (picture).
  - b. White Peoples:
    1. Hamitic Types: Berbers 2323; Tuaregs 33; Copts and Fellahin 1094, 1096; Kabyles, Masai, Gallas, Somalis 37.
    2. Semitic Types: Arabs 232; Bedouins 165.
  - c. Brown Peoples: Hovas and Malagasies of Madagascar 2105, 2106.
- D. Distribution of Population: See map on page 40, and map facing page 40.

# Divisions of Africa

I. NORTHERN AFRICA:
- A. Egypt: **1092** (Independent under British Supervision).
  - a. Area, about **350,000** square miles; Population, about **13,000,000.**
  - b. Chief Products: Cotton 904; Wheat, Barley 1096; Corn 891; Millet 2239; Rice 3015; Sugar 3385; Clover 810; Petroleum 2755; Cotton and Silk Goods, Morocco Leather, Pottery 1097.
  - c. Chief Cities: **Cairo 566; Alexandria 87; Port Said 3384; Tanta 1096; Assiut 1094; Suez 3384; Damietta 1096.**
- B. Anglo-Egyptian Sudan: **1092** (British).
  - a. Area, about **1,000,000** square miles; Population, about **3,400,000.**
  - b. Chief Products: Gum Arabic 1552; Ivory 1853; Cotton, Ostrich Feathers, Palm Nuts, Dates, Sesame, Hides, Skins, and Gold 1093.
  - c. Chief Cities: **Khartum and Omdurman 1093.**
- C. Tripoli: **3541** (Italian).
  - a. Area, about **406,000** square miles; Population, about **1,000,000.**
  - b. Chief Products: Dates, Olives, Lemons, Figs, Grapes, Cereals, Saffron, Almonds, Bananas, Barley, Cattle, Sponges.
  - c. Chief Cities: **Tripoli and Bengazi 3542.**
- D. Tunis: **3549** (French).
  - a. Area, **50,000** square miles; Population, about **2,000,000.**
  - b. Chief Products: Olives, Wheat, Barley, Oats, Grapes, Dates, Almonds, Oranges, Lemons, Pistachios, Alfa Grass, Henna, Cork, Sheep, Goats, Cattle, Sardines, Tunny, Lead, Zinc, Iron, and Manganese.
  - c. Chief Cities: **Tunis 3549** (picture), **Sfax, Susa, Kairwan 3550.**
- E. Algeria: **96** (French).
  - a. Area, **222,180** square miles; Population, about **5,500,000.**
  - b. Chief Products: Wheat, Barley, Oats, Corn, Potatoes, Artichokes, Beans, Peas, Tomatoes, Flax, Silk, Tobacco, Wine, Tropical Fruits, Olive Oil, Cotton, Cork, Sheep, Goats, Cattle, Sardines, Tunny, Iron, Lead, Zinc, and Coal.
  - c. Chief Cities: **Algiers, Oran, Constantine 97.**
- F. Morocco: **2327** (French, Italian, and Neutral).
  - a. Area: French Protectorate, **220,500** square miles; Spanish Morocco, **10,900** square miles; Tangier (neutral zone), **140** square miles; Total Population, about **6,000,000.**

b. **Chief Products:** Barley, Wheat, Beans, Oats, Corn, Linseed, Olives, Oranges, Lemons, Dates, Almonds, Figs, Sardines, Tunny, Sheep, Goats, Cattle, Horses, Iron, and Silver.
c. **Chief Cities: Morocco or Marakesh (see Fact-Index); Fez 2328; Tangier 2328 (picture).**

G. **Rio de Oro and Adrar: see Fact-Index** (Spanish).
a. **Area, about 109,200 square miles; Population 30,000.**
b. **Products:** This colony is virtually desert land, without important products.
c. **Capital: Villa Cisneros.**

II. EASTERN AFRICA:

A. **Eritrea: see Fact-Index** (Italian). Area 45,800 square miles; population 45,000. Chief products: Live Stock, Meat, Hides, Butter, Pearls and Mother of Pearl, Vegetable Ivory, Salt, Gold. Chief cities: **Asmara, Massowah.**

B. **Somaliland: See Fact-Index.**
a. **Italian Somaliland:** Area, about 139,400 square miles; population 650,000. Chief industries: Cattle Raising, Agriculture. Chief city, **Mogadisho.**
b. **British Somaliland:** Area 68,000 square miles; population 300,000. Chief products: Skins, Hides, Gum, Resins, Cattle, Sheep. Chief city, **Berbera.**
c. **French Somaliland:** Area, about 5,790 square miles; population 208,000. Chief products: Coffee, Ivory, Hides, Skins, Salt. Chief city, **Djibouti.**

C. **Abyssinia: 3** (Independent).
a. **Area, about 350,000 square miles; Population 5,000,000.**
b. **Resources and Products:** Hides, Skins, Coffee, Wax, Ivory, Civet, Barley, Millet, Wheat, Tobacco, Iron, Gold, Coal, Silver, Sulphur, Timber, and Rubber.
c. **Chief City: Addis Abeba (capital).**

D. **British East Africa:**
a. **Kenya Colony: 1068.** Area, about 347,000 square miles; population 2,810,000. Resources and products: Rice, Coconuts, Cotton, Groundnuts, Cassava, Sugar Cane, Bananas, Wheat, Barley, Corn, Flax, Coffee, Sisal Hemp, Live Stock, Timber. Chief cities: **Mombasa, Nairobi** (capital).
b. **Uganda: 1068.** Area, about 110,300 square miles; population 3,300,000. Resources and products: Cotton, Coffee, Para Rubber, Cocoa, Oil-Seeds, Timber, Bananas, Ivory. Chief cities: **Entebbe** (British capital), **Buganda** (Native capital).
c. **Tanganyika Territory: 1069** (former German East Africa). Area, about 384,200 square miles; population 7,700,000. Resources and products: Coco-Palms, Coffee, Rubber, Sugar, Cotton, Tea, Cardamom, Sisal Hemp, Live Stock, and Timber. Chief city: **Dar-es-Salaam** (capital).
d. **Islands of Zanzibar and Pemba: 3837.** Area, about 1000 square miles; population, about 196,700. Products: Cloves, Coconuts (Copra), Hides, Pottery, Coir Fiber, Rope, Soap, Oil, Jewelry, Mats. Chief city: **Zanzibar.**

E. **Nyasaland: See Fact-Index** (British). Area, 39,600 square miles; population 1,204,000. Resources and products: Cotton, Tobacco, Coffee, Tea, Live Stock. Chief trade center, **Port Herald.**

F. **Mozambique or Portugese East Africa: 1069-70.**
a. **Area, about 428,150 square miles; Population 3,120,000.**
b. **Chief Products:** Sugar, Coconuts, Rubber, Bees-wax, Ivory, Gold, Coal.
c. **Chief Cities: Mozambique, Lourenço Marquez.**

III. WESTERN AFRICA: **33-4.** Products typical of Western Africa are Mahogany, Ebony, Ivory, Rubber, Groundnuts, Manioc, Yams, Gum, Palm Oil and Kernels, Dyewoods, Hides, Skins, Feathers.

A. **French West Africa and the Sahara:**
a. **Senegal: see Fact-Index.** Area, 74,112 square miles; population, 1,205,000. Chief cities: **St. Louis** (capital), **Daker.**
b. **French Guinea: see Fact-Index.** Area, 95,218 square miles; population, 1,580,000. Chief city, Konakry.
c. **Ivory Coast: see Fact-Index.** Area, 121,967 square miles; population, 1,407,000. Chief cities: **Bingerville** (capital), **Grand Bassam.**
d. **Dahomey: see Fact-Index.** Area, about 42,460 square miles; population, about 860,000. Chief city, **Porto Novo.**
e. **French Sudan: 3384.** Area, about 366,700 square miles; population, about 2,400,000. Chief cities: **Bamako** (capital), **Timbuktu.**
f. **Upper Volta:** Area, about 154,400 square miles; population about 3,000,000. Chief city, **Ouagadougou.**
g. **Togo: 40** (French share of former German Togoland). Area, about 21,200 square miles; population, about 500,000. Chief cities: **Lome, Anecho.**
h. **Mauritania** (population, 240,000) and **Territory of Niger** (population, 700,000); joint area, 694,800 square miles of desert land equally divided between the two districts.

B. **British West Africa:**
a. **Nigeria: see Fact-Index.** Area, about 332,000 square miles; population, about 17,500,000. Chief city, **Lagos.**
b. **Cameroon: see Fact-Index** (British portion of former German Cameroon). Area, about 30,000 square miles; population, about 400,000. Chief city, **Victoria.**

c. **Gambia: see Fact-Index.** Area, about 4,130 square miles; population, about 240,000. Chief city, **Bathurst.**
d. **Sierra Leone: see Fact-Index.** Area of **Colony,** about 4,000 square miles; population, about 76,000. Area of **Protectorate,** about 27,000 square miles; population, about 1,328,000. Chief city, **Freeport.**
e. **Gold Coast: 33** (includes part of former German Togoland). Area, about 80,000 square miles; population, about 1,506,000. Chief city, **Accra.**

C. **Spanish West Africa: see Fact-Index. Rio Muni:** area, 9,470 square miles; population, 200,000. **Fernando Po:** area, 780 square miles; population, about 25,000.
D. **Portugese Guinea: see Fact-Index.** Area, about 13,900 square miles; population, 289,000. Chief city, **Bolama.**
E. **Liberia: 1990** (independent Negro Republic under protection of United States). Area, about 43,000 square miles; population, about 2,000,000. Chief city, **Monrovia.**

IV. MIDDLE AFRICA:
A. **French Equatorial Africa: 33–4, 40.**
a. **Area, 1,037,100 square miles; Population, about 9,000,000.**
b. **Products and Resources:** Rubber, Palm Oil, Ivory, Coffee, Live Stock, Copper, Zinc, Lead, and wild forest products similar to those listed under West Africa.
c. **Chief Ports: Port Gentil, Libreville.**
B. **Cameroon: see Fact-Index** (French). Area, about 166,500 square miles; population, about 1,500,000. Chief products: Coffee, Tobacco, Palm Oil, Ivory.
C. **Congo State (Belgian): 859.**
a. **Area, about 900,000 square miles; Population, about 11,000,000.**
b. **Products and Resources:** Rubber, Palm-nuts, Palm Oil, Cocoa, Ivory, Coffee, Rice, Cotton, Tobacco, Cattle, Gold, Diamonds, Copper, Coal, Iron, Tin, and Manganese.
c. **Chief Cities: Boma (capital), Leopoldville.**
D. **Angola: see Fact-Index** (Portuguese).
a. **Area, 484,800 square miles; Population 4,125,000.**
b. **Resources and Products:** Coffee, Rubber, Wax, Coconuts, Ivory, Fish, Tobacco, Petroleum, Asphalt, Copper, Iron, Salt, Gold.
c. **Chief Cities: Loanda (capital), Benguela.**

V. SOUTH AFRICA: **3279** (British).
A. **Basutoland: 3283, 3282 (map).** Area, 11,716 square miles; population, about 405,000. Products and resources: Wool, Wheat, Corn, Kaffir Corn, Live Stock, Iron, Copper, Coal. Chief City: **Maseru** (capital).
B. **Bechuanaland: 3283, 3282 (map).** Area, about 275,000 square miles; population, about 126,000. Chief products: Cattle, Sheep, Goats, Corn, Kaffir Corn, Gold, Silver. Chief cities: **Francistown, Mafeking.**
C. **Rhodesia: 3282–3.**
a. **Area, about 440,000 square miles; Population, about 1,740,000.**
b. **Products and Resources:** Cattle, Sheep, Goats, Dairy Products, Hides and Skins, Gold, Silver, Copper, Zinc, Lead, Coal, Diamonds, Corn, Cotton, Wheat, Fruits, Rubber, Timber.
c. **Chief Cities: Salisbury (capital of Southern Rhodesia), Bulawayo, Livingstone (capital of Northern Rhodesia).**
D. **Swaziland: 3283, 3282 (map).** Area, 6,678 square miles; population, about 100,000. Products and resources: Tin, Gold, Cattle, Sheep, Goats, Pigs, Horses, Tobacco. Chief city: **Mbabane.**
E. **Southwest Africa Protectorate: 3283, 3282 (map).**
a. **Area, 322,400 square miles; Population, about 200,000.**
d. **Products and Resources:** Diamonds, Copper, Tin, Marble, Cattle, Sheep, Goats, Corn, Wheat.
c. **Capital and Chief City: Windhuk.**
F. **Union of South Africa: 3283.** This includes the provinces of **Cape of Good Hope, Natal 2398, Transvaal 3526, Orange Free State 2590.**
a. **Area, about 475,000 square miles; Population, about 6,000,000.**
b. **Chief Products and Resources:**
1. Agricultural Products: Wheat, Barley, Oats, Kaffir Corn, Potatoes, Tobacco, Cotton, Sugar.
2. Live Stock and Dairy Products: Butter, Cheese, Sheep, Goats, Cattle, Pigs, Horses, Mules, Asses, Ostriches, Wool, Mohair, Hides, Skins, Ostrich Feathers.
3. Minerals: Gold, Diamonds, Coal, Copper, Tin.
4. Manufactures: Leather, Tobacco, Dynamite, Soap, Rope, Wine, Furniture, Vehicles.
c. **Chief Cities: Cape Town (capital of Cape Province) 640; Kimberley, Port Elizabeth, Pietermaritzburg (capital of Natal), Pretoria (capital of Transvaal), Johannesburg 1895, Bloemfontein (capital of Orange Free State).**

VI. MADAGASCAR: **2105** (French).
A. **Area, 228,000 square miles; Population, about 3,546,000.**
B. **Resources and Products:**
a. **Agriculture:** Rice, Sugar, Coffee, Manioc, Cotton, Vanilla, Tobacco, Cloves, Rubber.
b. **Mineral Resources:** Gold, Iron, Copper, Lead, Silver, Zinc, Nickel, Sulphur, Graphite, and Coal.
c. **Manufacturing:** Silk, Cotton Goods, Straw Hats, Metal and Food Products.
C. **Chief Cities: Antananarivo (capital), Tamatave.**

# ASIA

ASIA, the giant of the continents, presents many extreme contrasts. It contains Mt. Everest, the highest peak in the world, and the Dead Sea basin, the lowest valley—more than 1000 feet below ocean level. It has the most extensive table-lands and the greatest area of lowland plains; the bleakest and most barren desert and the most fertile and densely populated farm lands; regions of the severest cold and of the greatest heat. Asia is the home of more than half the human race, and out of Asia have come so many great contributions to human progress that it is often called "the Mother of Civilization." Unlike the other continents, which have their mountains and highlands near the coasts and their lowlands in the interior, Asia consists of a huge mass of lofty ranges and plateaus in the center, surrounded by low plains or ancient worn-down uplands. The heaviest rainfall in Asia is found south and southeast of this great mountain mass, in the regions bordering the Indian Ocean and the Pacific. Western Asia is cut off from moist winds by the mountain masses of Europe, while northern Asia gets only the moisture which remains in the westerly winds after they have swept across the great European plain. The interior basins and table-lands are segregated on all sides from ocean winds, and it is there that the extreme desert conditions are found. The great variety of climate, the almost impassable desert and mountain barriers account in great measure for the sharp racial distinctions which exist upon the continent. White, Yellow, and Brown peoples dwell there today, and some scientists believe that the Black and Red races of the world likewise originated there, the former spreading to Africa and the latter to America.

I. **POSITION AND AREA:**

A. **The northern tip of Siberia lies nearly 600 miles inside the Arctic circle, while the southern tip of the Malay Peninsula almost touches the Equator. Connected by land in the west to Europe and Africa, the continent reaches in the extreme northeast to within 36 miles of America.**

B. **One-third of the land surface of the globe is included in Asia. With the exception of the Antarctic continent, Asia has the greatest average altitude, due to the enormous mass of highlands which stretch across its center.**

II. **PHYSIOGRAPHY: 226, see also Maps next to page 232.**

A. **Mountains and Interior Plateaus:** The chief mountain ranges of Asia are connected in a long chain with many branches, stretching across the middle of the continent from Asia Minor to the Pacific Coast. The chief links in this chain are traced here from west to east.

a. **Plateau of Asia Minor or Anatolia, and Taurus Mountains: 234, 3557–8.**

b. **Elburz Mountains and Hindu Kush Marking Northern Boundary of the Great Iranian Plateau: 2733–4, 31, 226.**

c. **Great Pamir, the Meeting Place of the Hindu Kush, Karakoram (see Fact-Index), and Tien Shan Ranges: 226, 31, 3555.**

d. **Himalaya Mountains Forming a Vast Wall between the Central Highlands and the Plains of India: 1649, 1743.**

—Mount Everest, the Highest Mountain in the World: 1207.

e. **Plateau of Tibet between Himalayas and Kuenlun Mountains: 3495, 226, 740.**

f. **Plateau of Eastern or Chinese Turkestan between Tien Shan and Kuenlun Mountains: 3555, 226.**

g. **Gobi Desert and Plateau of Mongolia between Altai, Yablonoi, and Khingan Mountains: 740 (map), 228, 2285.**

B. **Detached Ranges:**

a. **Caucasus and Ural Mountains on Boundary of Europe: 663, 3606.**

b. **Volcanic Ranges on Pacific Side:** These extend through Kamchatka (1907), Sakhalin Island, the Kuril Islands, the islands of Japan (1863), the Korean Peninsula (1942), and Formosa (1332). These mountains are part of the same volcanic chain which runs through the islands of the East Indies (1070).

C. **Lowland Plains and Worn-Down Table-Lands:**

a. **Arabian Plateau and Plains of Mesopotamia: 165, 2200.**

b. **Plains of India and the Deccan: 1743–6.**

c. **Highlands and Plains of Indo-China and Siam: 1777, 3226.**

d. **Lowlands of Eastern China and Manchuria: 740, 2135.**

e. **Great Siberian Plains and Siberian Highlands: 3227–8.**

f. **Lowlands of Western or Russian Turkestan: 3556.**

D. **Chief Rivers and Lakes:**

a. **Rivers Flowing into the Arctic Ocean: Ob River, Yenisei, and Lena 230, 3228.**

b. **Into the Pacific: Amur 3228, 2135; Hwang 1706; Yangtze 3827.**

c. **Into the Bay of Bengal and Indian Ocean: Brahmaputra and Ganges 1745, 1393; Irrawaddy 540.**

d. **Into the Arabian Sea and Persian Gulf: Indus 1777; Tigris and Euphrates 3499, 1187, 2200.**

e. **Lakes and Inland Seas:**

1. Black Sea—Asia Minor Forms Its Southern Shore: 434.
2. Caspian Sea—Southern and Eastern Shores are Asiatic: 653.
3. Sea of Aral with Its Two Tributaries, Syr-Daria and Amu: 172.
4. Lake Balkash: (see Fact-Index); Lake Baikal: 305, 3228.

E. Coastline:
   a. **Arctic Ocean in the North: 189.**
   b. **Arms of the Pacific Ocean in the East:** Bering Sea 384; Sea of Okhotsk 1907, 2619, 228; Sea of Japan 2619, 1864 (map); Yellow Sea, East China Sea, South China Sea 740 (map), 2619.
   c. **Arms of the Indian Ocean in the South:** Bay of Bengal 1763, 1744 (map); Arabian Sea, Gulf of Oman, and Persian Gulf 1763, 2738, 166, 165 (map); Red Sea 2986.
   d. **Mediterranean Shores of Asia Minor and Syria: 2193–4.**
   e. **Chief Peninsulas:** Kamchatka 1907; Korean Peninsula 1943; Malay Peninsula 2129; Indian Peninsula 1743; Arabian Peninsula 165; Asia Minor 234.

F. **Principal Islands along Coast of Asia: Sakhalin, Kuril Islands, Japanese Group 1863; Formosa or Taiwan 1332; Hainan (see Fact-Index); Andaman and Nicobar Islands 1756, 1763; Ceylon 684; Cyprus 947.** The islands of the East Indies are treated in a separate Outline.

III. CLIMATE:
   A. **Great Variety of Asiatic Climate: 226–7.**
   B. **High Mountain Ranges and Interior Plateaus Suffer from Extremes of Heat and Cold and from Lack of Well-Distributed Rain: 3495, 1649–50, 2733–4, 3556, 2285, 739–40.**
      —The great "Desert Belt" stretching over from Africa: 3104.
   C. **Siberia with Its Dry Steppes, Frozen Tundras, and Rain-Soaked Eastern Coast: 3228.**
   D. **Climate of Arabian Peninsula and Asia Minor: 3557–8, 165.**
   E. **Tropical Climate with Heavy Rains in the South and Southeast: 1747, 2129, 740.**
   F. **Tremendous Importance of Monsoon Winds to Southern Asia: 1746–7, 3751, 230.**

IV. MINERAL RESOURCES: Almost every known mineral is found in Asia, but there has been comparatively little development of these resources. Details concerning the mineral wealth are given in the division devoted to the separate countries of Asia.

V. VEGETATION AND ANIMAL LIFE:
   Typical Plants of Asia:
   a. **Siberia: 226, 3228.** The region north of the great mountains falls into three zones: (1) the Arctic tundras where little grows except Moss and Berries; (2) the forest lands where there is enough rain to support extensive growths of Pine, Fir, Larch, Birch, Willow, and Poplar; and (3) the dry steppes where Grasses are the prevailing vegetation.
   b. **Central Highlands and Deserts: 3495, 3555, 2734, 165.** Except in rare sheltered valleys, desert oases, or the southern slopes of a few ranges, little vegetation of importance is found in the great mountain and desert belt which stretches across Asia.
   c. **Temperate Slopes of the Himalayas: 1650, 1748.** The southern sides of the great mountain barrier, exposed as they are to the effects of the monsoon winds, support a dense vegetation of trees and undergrowth. Typical forms are the Rhododendron, Magnolia, Deodar, Bamboo, and Cane.
   d. **Plains of India: 1748.** Typical forms here are the Babul, Mango, Banyan, Plantain, and Betel Palm.
   e. **Tropical South: 1748, 541, 2129, 3226–7.** Typical forms are Teak, Sandalwood, Satinwood, Ironwood, Ebony, Rosewood, Bamboo, Orchids, Catechu Plant, and innumerable Spice Plants (3317).
   f. **Eastern Coast:** The coastal plains of China are so densely inhabited and so closely cultivated that there is virtually no wild vegetation.

B. Typical Animals of Asia:
   a. **Northern Zone:** Reindeer 2993; Polar Bear and Brown Bear 355; Seal 3167; Wolf 3774; Fox 1943; Badger 304; Ermine 1174; Mink 1390; Sable-Marten 2155; Otter 2605; Gray Squirrel 3334; Hare 1585.
   b. **Central and Southern Zone:** Monkeys 2288–92; Elephant 1126; Rhinoceros 3006; Tiger 3498; Lion 2024, 1748; Leopard 1988; Himalayan Bear and Sun Bear 355; Hyena 1711; Jackal 1855; Wild Dog or Dhole 1748; Wild Ass 235; Camel 590; Yak 3827; Buffalo 527; Ibex and other Wild Goats 1719, 1476; many species of Wild Sheep 3198–3200, Antelopes 146–7, and Deer 979–81; Wild Boar 440; Mongoose 2286; Giant Squirrel 3334 (picture); Bats 345–6; Hornbill 1681; Pheasant 2759; Peacock 2699; Weaver-Bird 3710 (picture); Crocodile 923; Cobra 816; Python 2942.

VI. MANKIND IN ASIA:
   A. Native Peoples:
      a. **White:** Arabs and Bedouins 165, 232; Jews 1889; Syrians 3425; Armenians 213, 664; Kurds 1945, 213, 2735; Persians 2735; Hindus 1651, 1748; Afghans 31.
      b. **Yellow:** Southern Chinese 742; Indo-Chinese 1777, 2130, 3227; Tibetans 1748, 3496; Manchus 746, 2134; Kalmuks 2286; Cossacks 896; Tatars 3440; Kirghiz 230; True Mongols 2285; Turkomans 3555; Turks 3557–8; Japanese 1332, 1862; Koreans 1942.
      c. **Brown:** Gonds, Bhils, Tamils 1748; Veddahs 685; Malays 2130.
      d. **Black:** Semangs and Sakais 2130; Andaman Islanders 1756.
   B. Europeans in Asia—Exploration and Conquest:
      a. **Alexander the Great, First European Leader to Invade Asia: 1752, 87.**
      b. **Marco Polo, First European Traveler to Cross the Whole of Asia: 2874.**
      c. **Vasco da Gama Finds Sea Route around Africa to Asia: 233, 2888, 640.**
      d. **The Work of Francis Xavier, Exploring Missionary: 3823.**

e. Portuguese, Dutch, French, and British in India: 1752–3.
f. Achievements of Robert Clive and Warren Hastings: 795, 1596.
g. Russians Spread over Northern Asia: 233, 3227–8.
h. China Forced to Open Doors to Europeans: 746.
i. Commodore Perry in Japan: 233, 1862.
j. British in Tibet under Col. F. E. Younghusband: 3496.

# Asiatic Russia and Allied Territory

ASIATIC Russia consists chiefly of Siberia and Western Turkestan. Western and northern Siberia remained after the rise of the Bolshevists a part of the Russian Soviet Republic. The territory south of the Lena River, between Lake Baikal and Vladivostok, asserted its independence under the name of the Far Eastern Democratic Republic, but signed a permanent treaty of friendship with the Soviet Republic. In Russian Turkestan several independent soviets arose, which joined, however, the Soviet Federation. The two states of Bokhara and Khiva in southern Turkestan also organized as soviets and joined the federation. On the other side of the Caspian Sea in the Caucasus, the states of Georgia, Azerbaijan, and Armenia pursued the same course. All of these regions are treated in this section.

I. PHYSIOGRAPHY:
  A. Siberian Plains—Divided into Arctic Tundras, Central Timber Lands, and Southern Steppes: 3227–8, 190, 226, 230.
  B. Plains and Deserts of Western Turkestan: 3555–6.
  C. Mountains and Highlands:
    a. Ural Mountains on the Boundary between European and Asiatic Russia: 3606.
    b. Eastern Highlands 3228; Stanovoi Mountains (see Fact-Index).
    c. Tien Shan, Pamir, Hindu Kush, and Elburz on Southern Border: 226, 3555, 2734, 31.
  D. Rivers: Ob, Yenisei, Lena, and Amur 230, 3228, 2135.
  E. Lakes and Inland Seas: Caspian Sea 653; Sea of Aral 172; Lake Baikal 305, 3228; Lake Balkash (see Fact-Index).

II. RESOURCES AND PRODUCTS: 3228, 3556.
  A. Agriculture: Wheat, Rye, Oats, Barley, Vegetables.
  B. Stock Raising and Dairying: Cattle, Sheep, Camels, Eggs, Butter.
  C. Timber and Timber Products.
  D. Minerals and Mining: Coal, Iron, Petroleum, Copper, Lead, Silver, Gold, Platinum, Graphite, Tin, Zinc, Salt, Mica, Precious Stones.
  E. Fur Industry: Seal, Fox, Ermine, Mink, Sable-Marten, Otter, Gray Squirrel.
  F. Manufacturing: Rugs (3079), Textiles, Leather.

III. AREA AND POPULATION:
  A. Siberia (under Russian Soviet Republic): Area, about 4,200,000 square miles; Population, about 9,200,000.
  B. Russian Turkestan (excluding Bokhara and Khiva): Area, about 1,200,000 square miles; Population, about 7,000,000.

IV. CHIEF CITIES:
  A. Siberia: Irkutsk, Omsk, and Tomsk 3229.
  B. Turkestan: Tashkend, Khokand, Samarkand 3556.

## STATES ALLIED TO RUSSIA

I. FAR EASTERN REPUBLIC: 3229.
  A. Area, about 650,000 square miles; Population, about 1,800,000.
  B. Resources and Products: Wheat, Gold, Silver, Iron, and Fisheries.
  C. Chief Cities: Vladivostok 3652; Chita (see Fact-Index).

II. BOKHARA: 3555–6.
  A. Area, about 83,000 square miles; Population, about 1,250,000.
  B. Resources and Products: Wheat, Fruit, Silk, Rugs, Tobacco, Cotton, Live Stock (including Camels), Gold, Alum, Sulphur.
  C. Chief Cities: Bokhara and Karshi.

III. KHIVA: 3556.
  A. Area, about 24,000 square miles; Population, about 646,000.
  B. Resources and Products: Wheat, Cotton, Silk, Live Stock.
  C. Chief City: Khiva.

IV. ARMENIA: 211.
  A. Area, 140,000 square miles; Population, about 3,000,000.
  B. Resources and Products: Wheat, Fruits, Tobacco, Cotton, Iron, Copper, Mercury, Lead, and Gold.
  C. Chief City: Erivan.

V. GEORGIA: 1434.
  A. Area, about 35,000 square miles; Population, about 2,700,000.
  B. Resources and Products: Grapes, Fruits, Silk, Bees, Live Stock, Manganese, Copper, Coal, Lead, Iron.
  C. Chief Cities: Tiflis (capital), Kutais, Sukhum.

VI. AZERBAIJAN: 664, 3084.
- A. Area, 40,000 square miles; Population, about 4,600,000.
- B. Resources and Products: Petroleum (2749, 2752), Wheat, Cotton, Silk, and Live Stock.
- C. Chief City: Baku.

# Japan

IT is important to observe how Japan, whose geographical situation so strikingly resembles that of Great Britain, has come to play a part in Asiatic affairs closely akin to the British world policy. Less than a century ago Japan was an isolated island-state, having apparently no interest in the outside world. Its people pursued agriculture and primitive crafts, unmindful of the march of western civilization. Then, as if by magic, all this was transformed. Within the span of one man's lifetime, Japan became a power in world politics and in world commerce. The home islands were no longer able to produce enough food for the expanding population, so the Japanese were forced to build up manufacturing industries and to develop a foreign commerce to dispose of their manufactured products. The Japanese emigrated in large numbers to foreign lands, particularly to China, Australia, the islands of the Pacific, and the western coast of North America. The Japanese government feeling the need of additional territory for commercial expansion seized every opportunity to gain a foothold on the mainland of Asia. To support its claims and gain an equal voice in international politics, Japan built a powerful navy and organized a large and efficient standing army. A victorious war with Russia, an alliance with Great Britain, and a strategic position during the World War further advanced Japanese prestige and increased Japanese possessions. Meanwhile the Japanese people had gained a greater measure of political liberty and developed individual enterprise. Today, Japan's desire to be the dominant factor in the affairs of China and to develop the vast resources of that country along lines favorable to Japanese interests is one of the delicate problems in international relations.

I. PHYSIOGRAPHY:
- A. Volcanic Mountains of Japan: 1863.
  - a. Most prominent peak Mount Fujiyama: 1866 (picture).
  - b. Earthquakes: 1064.
- B. Important Lowlands of Japan: 1864.
- C. Broken Coastlines Provide Many Good Harbors: 1864.

II. NATURAL RESOURCES AND PRODUCTS: 1864–8.
- A. Agriculture: Rice (3013), Tea (3445), Wheat, Barley, Rye, Tobacco (3510), Vegetables, Bamboo.
- B. Mining and Minerals: Copper, Iron, Petroleum, Silver, Kaolin Clay, Coal (supply insufficient for needs of islands).
- C. Forests and Forest Products: 1866.
- D. Fresh and Salt Water Fisheries: Sturgeon, Mackerel, Salmon, Flounder, Halibut, Shad, Herring, Oysters.
- E. Manufacturing: Cotton Goods, Silk (3234–6 pictures), Woolens, Iron and Steel Products, Matches, Toys, Pottery, Glassware, Lacquer-ware (1954), Paper, Camphor (594), Art Objects (1873–6), Ink, Machinery and Chemicals.

III. CHIEF CITIES: Tokyo (capital) 3510; Osaka 2602; Kobe 1864; Kyoto 1945; Nagoya 2387; Yokohama 3830.

IV. POSSESSIONS:
- A. **Korea: 1942.** Area, 84,738 square miles; population, about 17,500,000. Chief resources and products: Rice, Wheat, Beans, Tobacco, Cotton, Live Stock, Gold, Copper, Iron, Coal. Chief city, Seoul 1943.
- B. **Formosa: 1332.** Area, about 14,000 square miles; population, about 3,700,000. Resources and products: Rice, Tea, Sugar, Sweet Potatoes, Camphor, Fish, Live Stock, Coal. Chief city, Taihoku.
- C. **Japanese Sakhalin: 1863.** Area, about 13,000 square miles; population, about 100,000. Resources and products: Timber, Fish, Coal, and Gold.
- D. **Other Possessions:** Kuril and Nansei Islands 1863; Marianas or Ladrones, Pelew, Caroline, and Marshall Islands 2620, 2624; Kwangtung (leased territory in Manchuria) 2135; Kiaochow (part of Shantung district, administered under mandate) 3195.

# China

CHINA has an area larger than that of the United States, Mexico, and Central America put together; and its population is almost as great as the combined population of North America, South America, and Africa. Yet the power latent in this vast land and its countless people is for the most part lost through lack of organization. The Chinese are industrious, thrifty, resourceful, and physically vigorous; as settlers in foreign lands they make their own way with skill and independence, accumulating modest wealth in the face of all competition. But this very independence and attitude of "every-man-for-himself" stands in the way of the effective political organization of the Chinese at home. Only the rivalry of foreign powers, which have prevented one another from taking advantage of China's weakness, has kept this great country more or less intact and politically independent. Today, there are signs of an aroused national feeling in China. Out of revolutions and

disorder the great mass of the people seem to be awakening to their opportunities and to the need for united action. Railroads to tap the vast mineral wealth of the interior are the greatest present need.

I. DIVISIONS OF GREATER CHINA: The province of **China proper** occupies the southeastern corner of the country. The other provinces or districts are **Manchuria (2134)** in the northeast, **Mongolia (2285)** in the north, **Sinkiang including Chinese Turkestan (3555)** in the west, and **Tibet (3495)** in the southwest.

II. PHYSIOGRAPHY:
- A. Plains of China and Manchuria: **740, 2135.**
  —Rich "Loess" Soil: **3273, 3750.**
- B. Mountains and Plateaus:
  - a. Khingan Mountains of Manchuria and Mongolia: **2135, 2285, 740** (map).
  - b. Altai Mountains and the Plateau of Mongolia, Including the Gobi Desert: **2285, 740** (map).
  - c. Tienshan and Kuenlun Mountains Inclosing the Plateau of Chinese Turkestan: **3555, 226.**
  - d. Plateau of Tibet Bordered on the South by the Himalayas: **3495, 1649.**
- C. Rivers: Yangtze **3827**; Hwang **1706**; Amur **2135**; Si-kiang (see Fact-Index).
- D. Island of Hainan: **740** (map), see also Fact-Index

III. RESOURCES AND PRODUCTS: **744, 2135, 2285, 3556, 3495.**
- A. Agriculture: Rice (**3013**), Wheat, Barley, Corn, Millet, Sugar, Indigo, Tobacco, Soy Beans (**3297**), Tea (**3445**), Ginseng (**1460**), Bamboo (**323**), Cotton.
- B. Live Stock: Pigs, Cattle, Buffaloes, Sheep.
- C. Fisheries: **749, 1286, 751** (picture).
- D. Minerals and Mining: Coal, Iron, Petroleum, Copper, Tin, Antimony, Gold, Silver, Lead, Bismuth.
- E. Silk Industry: **3234**; Pearl Fishing: **2703.**
- F. Manufacturing: Textiles, Pottery, and Porcelain (**2882, 2903**); Rugs (**3079**); Lacquer-ware (**1954**), Paper, Pig Bristles.
- G. Transportation: There are few railways in China, but the network of rivers and canals, including the Grand Canal (**625**), is very important to commerce **230, 749, 638, 3827, 1706.**

IV. POPULATION, AREA, AND CHIEF CITIES:
- A. China Proper: **739.**
  - a. Area, about **1,533,000** square miles; Population, about **336,000,000.**
  - b. Chief Cities: Peking (capital) **2707**; Shanghai **3195**; Canton **638**; Tientsin **3498**; Nanking **2389**; Foochow **1319**; Hankow **1574**; Hangchow **1574.**
- B. Manchuria: **2134.** Area, about 364,000 square miles; population, about 12,000,000. Chief cities: Mukden 747 (picture); Harbin.
- C. Mongolia: **2285.** Area, about 1,370,000 square miles; population, about 2,500,000. Chief city, Urga.
- D. Sinkiang including Chinese Turkestan: **3555.** Area, about 550,000 square miles; population, about 1,200,000. Chief cities: Urumchi (capital), Yarkand, Khotan, Kashgar.
- E. Tibet: **3495.** Area, about 463,000 square miles; population, about 2,000,000. Chief city, Lhasa.

V. POSSESSIONS OF FOREIGN COUNTRIES ON CHINESE COAST:
- A. Hongkong: **1678,** (British). Area, 391 square miles; population about 570,000. Chief city, Victoria (commonly called Hongkong).
- B. Weihaiwei: see Fact-Index (British leased territory). Area, about 285 square miles; population, 150,000.
- C. Kwangchow: see Fact-Index (French). Area, about 190 square miles; population, about 168,000.
- D. Macao: see Fact-Index (Portuguese). Population, 75,000.
- E. Kwantung and Kiaochow (Japanese). See Outline on Japan.

# Indo-China and Malay Peninsula

THE peninsula of Indo-China is divided into French Indo-China (1777) in the east, Siam (3226) in the center, and a narrow strip of Burma down the west coast. The kingdom of Siam extends down into the Malay Peninsula (2129), where it meets the Malay States, which are under British control. The people of these countries show the mixed traits of the Hindus, Chinese, and Malays. The chief physiographic features consist of northern highlands, which spread like a fork down the east and west coasts, extending to the tip of the Malay Peninsula, and inclosing central lowlands and narrow coastal plains on the Gulf of Siam.

I. PRODUCTS AND RESOURCES: **1777, 3226, 2129.**
- A. Agriculture; Rice, Rubber, Corn, Tobacco, Tropical Fruits, Sago, Sugar Cane, Tapioca, Spices, Tea, Coffee.
- B. Forests: Ebony, Rosewood, Teakwood, Ironwood, Rattan.
- C. Minerals and Mining: Tin (**3504**), Coal, Tungsten, Gold, Iron, Copper, Zinc, Precious Stones (**1409**).

II. POLITICAL DIVISIONS:
- A. French Indo-China: **1777.** Consisting of five districts (Cochin-China, Anam, Cambodia, Tonkin, and Laos). Total area, about 300,000 square miles; population, about 17,000,000. Chief cities: Hanoi, Cholon, Pnompenh, Binh-Dinh, and Saigon.
- B. Siam: **3226** (Independent). Area, about 200,000 square miles; population, about 9,000,000. Capital and chief city, Bangkok (**326**).

C. Malay States: **2129** (British).
   a. Federated States: Area, about 27,500 square miles; population, about 1,037,000.
   b. Non-Federated States: Area, about 23,500 square miles; population, about 1,120,000.

D. Straits Settlements: **2130–1** (British). Area, about 1350 square miles; population, about 715,000. Chief city, Singapore (**3243**).

# India

INDIA is the home of a population almost as great as China's and of a civilization more ancient than that of Europe. This civilization is rooted in great measure in the religion and religious customs of the Hindus, complicated by the later arrival of a wave of Mohammedanism which continues to be a powerful influence in the land. The difficulties which the British encounter in ruling this empire are caused by the combined influence of religious opposition and the extreme poverty of the great mass of the people. While much of the soil is exceedingly fertile, there are also large arid and unfruitful areas, particularly in the west. One of the most important tasks in India is to increase the territory available for agriculture by stimulating irrigation enterprises, and to establish manufacturing industries which will utilize the surplus "man-power." A large proportion of the natives, however, strongly resent the effort to make them work in factories and express a desire to return to the old household arts of their forefathers. Frequent demands for home rule have been made in recent years.

I. PHYSIOGRAPHY:
   A. Mountains and Plateaus:
      a. Himalaya Mountains and Hindu Kush on Northern Border: **1649, 226.**
      b. Baluchistan Highlands in the Extreme West: **1743, 226.**
      c. Highlands of Burma in the Extreme East: **541.**
      d. Deccan Table-land in the South, Surrounded by the Vindhya Mountains and the Eastern and Western Ghats: **1744, 1745–6.**
   B. Plains of Hindustan between Northern Mountains and Deccan: **1745.**
   C. Rivers: Indus **1777**; Ganges **1393**; Brahmaputra **382**; Irrawaddy **540.**

II. RESOURCES AND PRODUCTS: **1751–2, 541, 1707, 382, 653.**
   A. Agriculture: Millet, Rice, Wheat, Cotton, Flax, Jute (**1906**), Sugar Cane, Tea (**3445**), Indigo (**1777**), Mustard, Tobacco.
   B. Live Stock: Cattle (**1749** picture), Buffaloes (**527** picture), Sheep, Goats.
   C. Forests and Timber: **1748.** Teak (**3451**) and Sandalwood (**3123**).
   D. Minerals and Mining: Coal, Gold, Petroleum, Manganese, Salt, Lead, Tungsten, Mica (**2219**), Precious Stones (**1409**).
   E. Manufacturing: Cotton, Silk, Jute, Sugar, Shawls, Rugs, Lacquer-ware, Leather, Opium, Hemp.

III. CHIEF CITIES: Calcutta **572**; Bombay **451**; Madras **2108**; Hyderabad **1707**; Rangoon **541**; Delhi **989**; Lucknow **2075**; Benares **380.**

IV. NEIGHBORING STATES AND POSSESSIONS:
   A. Ceylon: **684** (British Colony). Area, about 25,000 square miles; population, about 4,700,000. Resources and products: Tea, Coffee, Rice, Cacao, Rubber, Spices, Graphite, Pearls and other Precious Stones. Chief city, Colombo.
   B. Nepal: **1744** (under British supervision). Area, about 54,000 square miles; population, about 5,600,000. Chief city, Khatmandu.
   C. Bhutan: **1744** (under British supervision). Area, about 20,000 square miles; population, about 250,000. Chief city, Punakha.
   D. French India: **1756.** Consisting of five small colonies (Pondicherry, Karikal, Yanaon, Mahe, and Chandernagore). Total area, 203 square miles; population, about 265,000.
   E. Portuguese India: **1756.** Consisting of three establishments (Gôa, Damao, and Diu). Total area, 1638 square miles; population, about 550,000.

# Persia and Afghanistan

THESE two countries occupy the rugged mountains and arid table-lands which divide what we call the Near East from Central Asia and the Far East. They are among the least progressive of the Asiatic states, having virtually no railroads or industrial organization. In the more remote mountain regions dwell many peoples and tribes which are virtually independent. Afghanistan has no seacoast, while Persia's coastlines contain no harbors of importance. The link which binds these countries to the Near East and to northern India is the prevailing influence of the Mohammedan religion.

I. PERSIA: **2733.**
   A. Physiography: The **Elburz Mountains** in the north, and the vast stretches of the **Iranian Plateau** in the center and south are the chief physical features. The **Caspian Sea** (653) forms part of the northern boundary, while, in the south, Persia extends along the **Persian Gulf** (2738) and the **Gulf of Oman.**
   B. Resources and Products:
      a. Agriculture and Live Stock: Wheat, Barley, Rice, Fruits, Sheep, Camels, Cattle, Goats.

b. **Minerals:** Iron, Coal, Copper, Lead, Manganese, Borax, Nickel, Petroleum.
c. **Manufacturing:** Silk, Woolens, Carpets, Opium, Gums, Leather.

C. **Area, about 628,000 square miles; Population, about 9,000,000.**
D. **Chief Cities: Teheran (capital) 2734, Tabriz, Ispahan.**

II. **AFGHANISTAN: 31.**
A. **Physiography:** The northeastern half of Afghanistan is covered by the ridges and spurs of the **Hindu Kush** mountains; the southwestern half is a continuation of the **Iranian Plateau,** extending over from Persia.
B. **Resources and Products:**
a. **Agriculture and Live Stock:** Wheat, Barley, Rice, Millet, Corn, Fruits, Tobacco, Sheep, Goats, Camels, Cattle.
b. **Minerals:** Copper, Lead, Iron, Gold, Precious Stones.
c. **Manufacturing:** Silks, Felt, Carpets, Leather, Food Products.
C. **Area, about 245,000 square miles; Population, about 6,400,000.**
D. **Capital and Chief City: Kabul.**

# Divisions of Southwestern Asia

POLITICAL conditions in the Near East are so unsettled and political boundaries are subject to such constant readjustments that it is better for geographical purposes to divide this part of Asia into a few large natural regions rather than to attempt to study separately each of the many states, principalities, emirates, mandates, or other political units, whose conflicting claims form one of the chief sources of international discord in Europe and Asia. Before the World War, this entire region formed part of the Turkish Empire, but during and after the war it split into many fragments. Here we shall consider four major divisions: (1) Asiatic Turkey proper or Anatolia, occupying chiefly the peninsula of Asia Minor; (2) Syria and Palestine, lying along the Mediterranean between Asia Minor and the Isthmus of Suez; (3) Mesopotamia, occupying the Tigris-Euphrates basin from northern Syria to the Persian Gulf; and (4) Arabia, comprising the entire Arabian Peninsula south of Mesopotamia and Syria. The republics of Armenia, Azerbaijan, and Georgia are treated under Asiatic Russia.

I. **ASIATIC TURKEY OR ANATOLIA: 3557.**
A. **Physiography:** The plateau of **Asia Minor** (234) is surrounded on all sides by mountains extending to the shores of the Black Sea and the Mediterranean, the most important being the **Taurus Mountains** in the south and southeast.
B. **Resources and Products: 3557, 234.**
a. **Agriculture and Live Stock:** Wheat, Oats, Barley, Tobacco, Cotton, Grapes, Olives, Figs, Sheep, Cattle, Goats, Asses, Horses.
b. **Minerals:** Copper, Coal, Zinc, Lead, Antimony, Manganese, Borax, Salt, Gold, Silver.
c. **Forests and Forest Products:** Timber, Gums, Wild Fruit.
d. **Manufacturing:** Cotton Goods, Woolens, Silk, Rugs, Leather, Opium, Olive Oil.
C. **Area, about 175,000 square miles; Population, about 8,000,000.**
D. **Chief Cities: Smyrna 3255, Brusa, Trebizond.**

II. **SYRIA AND PALESTINE: 3425, 2643.**
A. **Physiography:** Low mountains rise from the Mediterranean coast, except in the extreme south where there is a strip of coastal plain. Beyond these mountains lie narrow river valleys parallel to the coast, including the valley of the **Jordan** and the basin of the **Dead Sea,** which sinks far below sea level. Beyond these again lie the arid stretches which mark the beginning of the great **Arabian Desert.**
B. **Resources and Products: 3426, 2645.**
a. **Agriculture and Live Stock:** Wheat, Barley, Millet, Fruits, Tobacco, Cotton, Hemp, Olives, Sheep, Goats, Cattle, Camels, Asses, Horses.
b. **Minerals:** No rich mineral resources have been discovered, but there are traces of Iron, Lead, Copper, Lignite, and Petroleum.
c. **Manufacturing:** Silk, Olive Oil, Wine.
C. **Area, Population, and Chief Cities:**
a. **Syria** (French Mandate). Area, about 114,000 square miles; population, about 3,000,000. Chief cities: **Damascus 954, Aleppo, Beirut, Antioch 150.**
b. **Palestine** (partly British Mandate). Area, about 15,000 square miles (British mandate, 9,000 square miles); population, about 650,000. Chief cities: **Jerusalem 1885, Jaffa.**

III. **MESOPOTAMIA OR IRAK: 2200** (Arab state under British protection).
A. **Physiography:** Mesopotamia consists of a lowland plain which forms the valleys of the **Tigris** (3499) and the **Euphrates** (1187). It is for the most part treeless, and, except along the rivers, is an unproductive desert. However, with irrigation, the soil becomes exceedingly fertile.
B. **Resources and Products:** Wheat, Barley, Cotton, Dates, Petroleum.
C. **Area, about 143,000 square miles; Population, about 2,800,000.**
D. **Chief Cities: Bagdad 304, Basra.**

IV. **ARABIA: 165.** The territory of Arabia is divided into a group of independent and semi-independent native states, the most important of which are Hejaz, Asir, and Yemen along the Red Sea coast; Jebel Shammar and Nedjed-Hasa in central Arabia, the latter extending to the Persian Gulf; Koweit at the head of the Persian Gulf;

and Oman, extending around the eastern tip of the Arabian peninsula from the Persian Gulf to the Indian Ocean. The British protectorate of Aden (24) occupies the other tip of the peninsula at the mouth of the Red Sea.

A. **Physiography:** Arabia is mostly a great desert table-land bordered by narrow coastal plains and, in the south, by low mountain ranges.

B. **Resources and Products:** Dates, Live Stock, Hides, Wool, Coffee (from Mocha in the state of Yemen, 822).

C. **Total Area, about 1,250,000 square miles; Population, about 6,000,000.**

D. **Chief Cities: Mecca 2187, Medina, Mocha, Muskat, Aden 24.**

# East Indies

THE large group of islands lying between the southeast coast of Asia and the continent of Australia are known as the East Indies or the Malay Archipelago. The island of Sumatra marks the western extremity of the group, the Philippines the northern extremity, and the island of New Guinea the eastern extremity, the islands outside of these limits being considered as belonging to Asia, to Australia, or to some of the Pacific Ocean archipelagoes. The size of the larger East Indian islands is not ordinarily appreciated, because they are usually represented on small-scale maps; a clearer idea of their area may be obtained from the fact that two of them—New Guinea and Borneo—are each considerably larger than the state of Texas.

I. PHYSIOGRAPHY AND CLIMATE:

A. **Islands of Volcanic Origin, Containing Many Active and Extinct Cones: 2764, 3391, 671, 1072.**

B. **Typical Formation:** Most of the islands have mountainous interiors, cut up by river valleys and surrounded by coastal plains.

C. **Hot Equatorial Climate:**

a. **Tempering Effect of Mountains and Sea Winds: 1879, 2765, 3391, 671.**

b. **Heavy Rainfall: 2974, 3391, 2765.**

II. PEOPLE OF THE EAST INDIES:

A. **Chief Native Races:**

a. **Malayan Types:** Javanese 1879, Sumatrese 3391; Dyaks 467; Igorots 2765; Moros 2766.

b. **Papuans or Melanesians: 1072, 2451.**

c. **Negrito Types: 2765.**

B. **Discovery and Colonization by Whites: 1072.**

III. RESOURCES AND PRODUCTS: **2768–9, 1879, 3391, 468, 671, 2453.**

A. **Agriculture and Forest Products: Rice, Corn, Tea, Soy Beans, Spices (3317), Pepper (2723), Coffee (822), Cane Sugar, Cacao, Coconuts 818 (picture), Bananas, Tobacco, Manila Hemp (1630), Indigo (1777), Quinine (2950), Rubber (3072, 3074), Gutta-Percha (1554), Ebony, Teak, Sandalwood.**

B. **Minerals and Mining: Copper, Iron, Gold, Tin, Petroleum, Coal, Mercury, Precious Stones.**

IV. PRINCIPAL ISLANDS:

A. **Philippine Islands: 2764** (United States). Group comprises 7,083 islands, the two largest being **Luzon** and **Mindanao.** Total area, 115,026 square miles; population, about 10,350,000. Capital and chief city, **Manila 2136.**

B. **Sumatra: 3391** (Dutch). Area, about 167,000 square miles; population, about 4,000,000. Chief Cities: **Padang, Palembang.**

C. **Java: 1877** (Dutch). Area, 50,557 square miles; population, 35,000,000. Chief city, **Batavia 1878.**

D. **Madura: see Fact-Index** (Dutch). Area, 1,725 square miles, population, 2,000,000.

E. **Borneo: 467** (Dutch and British). Area, 290,000 square miles; population, 1,850,000. The island is divided into the following four districts:

a. **British North Borneo: 468.** Area, 31,106 square miles; population, 208,000. Chief city, **Sandakan.**

b. **Brunei: 468** (British). Area, 4,000 square miles; population, 32,000. Chief city, **Brunei.**

c. **Sarawak: 468** (British). Area, 42,000 square miles; population, 600,000. Chief cities: **Kuching** (capital), **Sibu.**

d. **Dutch Borneo:** Area, 212,800 square miles; population, 1,010,000. Chief cities: **Pontianak, Banjermasin.**

F. **Flores: see Fact-Index** (Dutch). Area, 5,850 square miles; population, 250,000.

G. **Timor: see Fact-Index** (Dutch and Portuguese). Area: Dutch, 5,200 square miles; Portuguese, 7,300 square miles. Population, about 600,000 equally divided between Portuguese and Dutch territory. Chief cities: **Delli** (Port.), **Kupang** (Dutch).

H. **Celebes: 671** (Dutch). Area, 72,000 square miles; population, 2,000,000. Chief city and capital, **Macassar.**

I. **Molucca Islands: see Fact-Index** (Dutch). Area, 144,120 square miles; population, 560,000. Chief city, **Amboyna.**

J. **New Guinea: 2451** (Dutch and British). Area, 300,000 square miles; population, about 1,000,000.

a. **Dutch New Guinea: 2453.** Area, 121,339 square miles; population, 555,000. Chief city, **Sorong.**

b. **British New Guinea: 2453** (Former German possession). Area, 70,000 square miles; population, about 300,000. Chief city, **Madang.**

c. **Papua: 2453** (British). Area, 90,540 square miles; population, about 250,000. Chief city, **Port Moresby.**

# AUSTRALIA

## New Zealand and Pacific Islands

AUSTRALIA is the smallest of the continents. It was the last of the inhabitable portions of the globe to be explored and settled by white men. Geologists tell us that this great island is probably the oldest land surface of the Earth, having emerged from the sea in exceedingly remote ages. Consequently its mountain masses are worn down and low. In size it is about equal to the United States, and if it were turned over in the north-to-south sense, it would almost fit the shape of the United States, the Cape York Peninsula taking the place of Florida. Occupying the same latitude as South Africa, it resembles South Africa in many important geographical features, chief of which is the division of the country into an arid western zone and a rainy eastern zone. The Australian natives may well be likened to the Bushmen and Hottentots of South Africa; both countries have had important gold rushes; and both countries are today part of the British Empire. Southeast of Australia lies New Zealand, the largest group of islands in the Pacific, outside of the East Indies. The remainder of the Pacific Islands lie scattered over the vast watery stretches which separate Asia and Australia from the two Americas, most of them lying within the tropics.

I. AUSTRALIA: **261.**

- A. Physiography: **261–2.**
  - a. Western Australian Plateau Including the Desert Region: **262.**
  - b. Great Central Plains: **262, 2449–50.**
  - c. East Australian Highlands, Including the Great Dividing Range: **262, 2471.**
  - d. Murray and Darling Rivers Form Only Important River System of Australia: **262–4.**
  - e. Coastline Smooth with Few Good Harbors: **262.**
    — Great Barrier Reef: **262, 886.**
  - f. Tasmania, the Only Important Island Belonging to Australia: **3438.**
- B. Climate: **262.**
  - a. Typical Tropical Climate in the North: **262, 2949.**
  - b. Seasonal Change in the South; High Temperature of the Interior **2471.**
  - c. Rainfall: Uncertain and Insufficient in the Interior and on the West Coast **262**; Heavy on Eastern Coast **262, 2949.**
  - d. Temperate Climate of Tasmania: **3438.**
- C. Vegetation and Animal Life: **265–6.**
  - a. Typical Vegetation: Eucalyptus 1186; Acacia 4; Tree Ferns, Gigantic Tulips, and Lilies 265; Tall Tropical Grasses 262.
  - b. Typical Animals: Rabbit 1585; Dingo (Wild Dog) 266; Kangaroo, Wombat, Bandicoot 1908; Gray Opossum 266 (picture); Tasmanian Devil 3438 (picture); Tasmanian Wolf 3439 (picture); Duckbill 1046 (picture); Spiny Ant-Eater 1047, 266 (picture); Frilled Lizard 2036, 2035 (picture); Laughing Jackass 266; Emu 1145 (picture); Cassowary 654; Black Swan 3400; Lyre Bird 2092; Brush Turkey and Mallee-Bird 1090; Bower-Birds 405.
- D. Mankind in Australia:
  - a. Discovery, Exploration, and Settlement; **266–7, 3438, 872.**
  - b. Natives: Blackfellows **261, 266, 2119 (picture)**; Tasmanians **3438.**
  - c. White Population: More than 95 per cent of the entire population is of British origin.
- E. Natural Resources and Industries: **264–5, 2949–50, 2471, 3438–9, 3638.**
  - a. Sheep and Cattle Raising the Most Important Industry.
  - b. Agriculture: Wheat **(3732)**, Oats, Barley, Corn, Hay, Potatoes, Sugar Cane, Grapes, Fruit.
  - c. Minerals and Mining: Coal, Gold, Silver, Lead, Copper, Tin, Zinc, Tungsten.
  - d. Manufacturing: Wool, Leather, Chemicals, Metal Products, Lumber.
- F. Divisions of Australia:
  - a. New South Wales: **2471.** Area, 309,432 square miles; population, 2,000,000. Capital and chief city, Sydney **3424.**
  - b. Victoria: **3638.** Area, 88,000 square miles; population, 1,500,000. Capital and chief city, Melbourne **2194.**
  - c. Queensland: **2949.** Area, 670,500 square miles; population, 738,000. Capital and chief city, Brisbane.
  - d. South Australia: see Fact-Index. Area, 380,070 square miles; population 470,000. Capital and chief city, Adelaide **268.**
  - e. Western Australia: see Fact-Index. Area, 975,920 square miles; population 332,000. Capital and chief city, Perth.
  - f. Tasmania: **3438.** Area, 26,215 square miles; population 200,000. Capital and chief city, Hobart.
  - g. Territories:
    1. Federal Capital Territory, Canberra: **628.**
    2. Northern Territory: see Fact-Index. Area, 523,620 square miles; population 24,706. Chief city, Port Darwin.

*consult the Easy Reference Fact-Index at the end of this work*

h. **British Possessions Administered by the Australian Commonwealth:** Territory of Papua (2453); Territory of New Guinea, including former German New Guinea (2453), New Britain Archipelago (former Bismarck Archipelago 2620), and that part of the Solomon Islands (2620) formerly owned by Germany.

II. NEW ZEALAND: **2499.**

A. Position and Area:

a. **The Dominion of New Zealand** consists of two large islands (North Island and South Island) and a smaller island (Stewart Island) lying near the southern tip of South Island. The group is situated about 1,300 miles southeast of Australia. Attached to the Dominion of New Zealand are several small islands and island groups, of which the most important are the Aukland Islands, Chatham Islands, Cook Islands, and Kermadec Islands.

b. **The area of New Zealand** is about equal to that of the state of Colorado.

B. Physiography and Climate: **2499.**

a. **North Island Consists of Plains and Plateaus Marked by Volcanic Cones and Hot Springs: 2499.**

b. **Rugged Cloud-Capped Peak of "Southern Alps" on South Island: 2499.**

c. **Climate:** Semi-tropical conditions prevail in the north, while the south is temperate. Rainfall is abundant everywhere.

C. Resources and Products: **2499–2500.**

a. **Agriculture and Live Stock: Wheat, Oats, Barley, Hay, Sheep, Cattle, Hogs, Horses.**

b. **Forests and Forest Products: Lumber and Kauri Gum.**

c. **Fisheries: Whaling is an Important Industry 3724, 3725** (picture).

d. **Minerals and Mining: Coal, Gold, Silver, Tungsten, Copper, Iron, Lead, Zinc, and Antimony.**

e. **Manufacturing: Wool, Leather, Meat Packing, Dairy Products, Clothing, Shoes, Metal Ware.**

D. People of New Zealand:

a. **The Native Maoris and Their Characteristics: 2499.**

b. **Discovery and Colonization: 2499.**

E. Chief Cities: **Wellington (capital), Auckland, Christchurch, Dunedin.**

III. PACIFIC ISLANDS: **2617.**

A. General Physiography and Climate:

a. **Volcanic Islands and Coral Islands: 2621–2, 886, 3658, 1601, 3120, 1239.**

b. **Mild Healthful Climate: 2623, 1601–2; Hurricanes and Typhoons: 3366, 1239, 3120.**

B. Resources and Products: **2622–3.**

a. **Wild and Cultivated Products:** Coconuts and Copra (818), Breadfruit (501), Sugar (3385), Pineapples (2809), Bananas (324), Taro, Yamp, Sago, Coffee, Rubber, Tea, Rare Woods.

b. **Sea Products:** Pearl Shell, Turtle Shell, Trepang or Bêche-de-mer (3165, 2623).

c. **Minerals:** Phosphate, Nickel (2506 picture).

C. Peoples of the Pacific Islands:

a. **Traces of Prehistoric Races: 2618, 1070.**

b. **Native Types of Today — Melanesians, Micronesians, and Polynesians: 2620–1.**

D. Principal Islands of the Pacific: **2624.**

a. **Melanesia: 2619–20.** Bismarck or New Britain Archipelago, Solomon Islands, and Santa Cruz (British); New Hebrides (British and French); New Caledonia and Loyalty Islands (French).

b. **Micronesia: 2620.** Marianas or Ladrones (Japanese except Guam 1545); Pelew Islands, Caroline Islands, and Marshall Islands (Japanese); Gilbert Islands (British).

c. **Polynesia: 2621–2.** Hawaiian Islands (United States) 1601; Fiji Islands (British) 1239; Samoan Islands (United States and British) 3120; Ellice Islands, Tokelau Islands, Tonga or Friendly Islands, and Cook Islands (British); Society Islands, Tubuai or Austral Islands, Marquesas, and Tuamotu or Low Archipelago (French).

# Polar Regions

SURROUNDING each of the poles of the Earth is a region of extreme cold, where permanent settlement is difficult if not impossible. Alike as the two polar regions are in this respect, they differ in almost all other characteristics. The North Polar or Arctic Region consists for the most part of a great ocean into which are thrust the northern ends of Europe, Asia, and North America, together with various groups of islands large and small. The South Polar or Antarctic Region, on the other hand, consists chiefly of a vast and lofty land mass cut off by hundreds of miles of open water from the other continents. Human settlements have in many cases penetrated far within the Arctic Circle, while the Antarctic Region is entirely uninhabited.

I. ARCTIC REGIONS: **189.**

A. Physiography and Climate:

a. **Arctic Ocean 189; Bering Strait 384, 228; Baffin Bay 189** (map), **see also Fact-Index.**

b. **Chief Islands in Arctic Circle: 189–90, map next to page 602.** Greenland (1539), Spitzbergen (2534), Franz Josef Land, Nova Zembla, New Siberia, Nicholas II Land, Baffin Land, Banks Land, Victoria Land, Grant Land, Wrangel Islands.

c. **Arctic Plains or Tundras:** In North America 76, 2515, 2528, 603; In Europe 1191, 3086; In Asia 226, 3228.

d. North Magnetic Pole: **1690.**
e. Climate: Extreme Cold, Sunless Winters 190, 1962; Midnight Sun 3394 (picture).

B. Animals and Vegetation:
a. Sea Life: Whale 3723; Dolphin 1026; Seal 3166; Walrus 3668.
b. Land Mammals: Arctic Fox 1337; Polar Hare 1585; White Wolf 3774; Polar Bear 355; Wolverine 3776; Ermine 1174; Musk Ox 2383.
c. Reindeer, the Domestic Animal of the North: **2993.**
d. Birds: Auk 258, 1090; Eider Duck 1046; Penguins 2864; Puffin 259, 413; Ptarmigans 1544; Sandpiper 414, 3261; Snow Bunting 534, 411; Snowy Owl 2607; Tern 1549; Teal 1044.
e. Vegetation: **190**; Lichens and Mosses 1994.

C. Natives of the Arctic Regions: Eskimos **1174**; Lapps **1962.**

D. Natural Resources and Industries: Fur-Bearing Animals **190, 1692**; Fishing **190**; Whaling **3724**; Sealing **3166**; Walrus Hunting **3668**; Coal **190, 2534.**

E. North Polar Explorations:
a. Some of the Chief Explorers and Their Work: **2859, 110, 120, 617, 384, 312, 119.**
b. Robert E. Peary the First Man to Reach the North Pole: **2703.**

II. ANTARCTIC REGIONS: **145.**

A. Physiography and Climate:
a. High Plateaus and Lofty Mountains: **145**; Average Elevation as Compared with other Continents: **2791** (diagram).
b. South Magnetic Pole: **1064.**
c. Severe Antarctic Climate because of Altitude and Land Mass: **145.**

B. Animals and Vegetation:
a. Only Few Birds Can Bear the Rigorous Climate: Penguin 2864; Petrel 2747; Albatross 80.
b. Sea Mammals: Seal, Sea-Lion, Sea-Elephant 3166; Whales 3723; Dolphin 1026.
c. Vegetation: Mosses and Lichens 1994, 145.

C. South Polar Explorations: **2862.**
a. Captain James Cook first to Penetrate the Antarctic Circle: **874.**
b. Achievements and Heroism of Robert F. Scott: **3149.**
c. Roald Amundsen first to Reach South Pole: **119.**

# Picture Aids to Geography Study

## GENERAL GEOGRAPHY

The Huge Stage on which Life's Drama is Played 1414–5.
Some Ancient Ideas about the Earth 1059.
The Story of the Map 2142.
How the Continents Compare 2791.
Land Formations and Their Causes 2789.
The Stone Pages that Tell Earth's Story 1419.
How School Slates Come Out of the Sea 1421
At the Foot of the Great Glacier 1465.
One of Earth's Vast Fiery Chimneys 3659.
The "House of Everlasting Fire" 3658.
The Pulse Beats of the Boiling Geyser 1455.
The Origin of an Oil Gusher 2751.
How We Learn about the Weather 3709.
The Picture Gallery in the Sky 808.
How Rain Falls around the World 2973.
The Greatest Heights and the Greatest Depths 51.
Black, Brown, Red, Yellow, and White Races of Mankind 2957.
Map Showing Routes of Explorers 110.
Links that Bind the Atlantic World Together 255.

## UNITED STATES

Note. With each of the state articles will be found series of pictures illustrating their respective wealth, industries, and chief scenic features. Those pictures are not included in the list given here.

The Aged Appalachians and the Young Rockies 158.
Picture Visits to National Parks 2401–3.
Ruins of a Cliff-Dwelling 205.
Where the Navajo Blankets are Woven 206.
The Overland Route in Early Days 584.
The Highest Spot in the United States 584.
The Oldest Living Thing 585.
The Girth of "General Sherman" 585.
Visiting the Wonders of Mammoth Cave 665.
State Street, Chicago, in 1836 and Today 722.
Chicago's World-Famous Boulevard 724.
A Civic Center Worthy of Cleveland's Greatness 792.
Nature's Landscape Art in Colorado 838.
The Beautiful "Queen City of the Plains" 841.
Getting Crops from Arid Lands 842.
This was a Thriving City Several Centuries Ago 844.
In the Heart of the Colorado Mountains 845.
A Splendid Natural Park near New Haven 866.
Connecticut's Famous "Charter Oak" 867.
The Scene of the Historic Fight with the Pequot Indians 867.
Cotton Boat on the Mississippi with a Full Load of Bales 901.
In the Land of the Everglades 1299.
The Ancient Peaks and Gorges of the Grand Canyon 1495.
The Stupendous Canyon that Baffles Description 1496.
The Trail of Commerce on America's Inland Seas 1511.
Strange Water Giants of the Great Lakes 1512.
Idaho Wool "on the Hoof" 1729.
Picturesque Memorial of a Grim Indian War 1732.
A Glimpse into Indiana's Famous Steel Industry 1760.
In the Busy City of Indianapolis 1763.
Indian Life in the Tepees of Older Days 1764.
A Citadel in the Desert 1766.
An Indian Moving Day 1767.
Propitiating the God of the Waters 1768.
Industry and Religion Among the Hopi Indians 1769.
Architecture of the Hunting Tribes 1770.
Making Arrow Heads of Stone 1771.
Indian Bows and Arrows 1771.
Indians Playing Ball on the Ice 1772.
Work of the Medicine Men among the Indians 1773.
Indian Architecture at Its Best 1774.
A Bit of Picturesque Scenery Along the Iowa River 1806.
Curing Kentucky Tobacco 1918.
Where Railroad Trains Go out to Sea 1921.
In America's Largest Library 1993.
View from Hollywood Across Los Angeles 2062.
In the Gay Season of the Mardi Gras 2071.
A Typical New England Village 2168.
In the Beautiful Connecticut Valley 2168.
Where the Battle of Lexington was Fought 2169.
Panoramic View of the Great Stock Yards and Meat Packing Plants in Chicago 2180–1.
An Airplane View of West Point 2237.
At the Great Ore Docks of Duluth 2257.
A View of the Mississippi from the Bluffs 2265.
Why the Mississippi is the "Father of Waters" 2267.
A Picturesque Valley among the Wooded Slopes of the Ozarks 2269.
The Cliff Drive Overlooking Kansas City 2272.
"Oceans" of Sheep on Montana's Rolling Hills 2310.

Washington's Home at Mount Vernon 2358.
Where Uncle Sam Makes Officers for the Navy 2419.
What Life is Like on a Big Nebraska Stock Farm 2430.
Bucking the Snows in Nevada 2446.
Logging in the White Mountains 2456.
Hoboken's Water Front on the Hudson 2460.
"Elephant Butte" Dam in the Rio Grande Valley 2464.
On the Busy Wharves of New Orleans 2468.
The Largest Cotton Warehouse in the World 2470.
In the Catskills — View across the Hudson Valley 2479.
Niagara Falls in Its "Working Clothes" 2482.
A Great City Surrounded by Water 2488.
The Woolworth Building at Night 2489.
The Motley Throngs on Ellis Island 2491.
Fascinating Scenes of North America's Great Metropolis 2492-3.
The Tilted Land that Gives Us Niagara 2503.
"Bad Lands" that aren't so Bad After All 2524.
What a Change Since Frontier Days in Omaha! 2581.
A Picturesque Stretch of the Columbia Valley 2594.
Portland and Its Guardian Mountain 2597.
In the Ozarks 2616.
Historic Shrines of Philadelphia 2761.
Looking into the Heart of the City of Steel 2813.
The Foundation Stone of New England 2841.
The Home of Captain Miles Standish 2842.
A Pueblo Indian Drilling a Turquoise 2933.
On the "Ridge of North America" 3035.
Harvesting Salt on the Shores of Great Salt Lake 3116.
Temple Square, Salt Lake City 3118.
Sand Dunes of Indiana near Lake Michigan 3123.
San Francisco Looking Eastward across the Bay 3125.
A Pit of High-Grade Kaolin 3291.
A Glimpse of the Vanishing West 3297.
Giant Sponges from the West Coast of Florida 3329.
Memphis from the Water Front 3466.
Sun-Curing Tobacco in Sunny California 3509.
A Section of the Famous "Tubes" Running under the Hudson River 3550.
At Work under the Hudson 3551.
How the Foreign-Born Population of the United States is Divided 3581.
Religions in the United States 3583.
Relative Value of Minerals Produced in United States 3585.
Great Industries of the United States 3589.
The Relative Value of Uncle Sam's Chief Farm Products 3591.
The Largest Block of Granite Ever Quarried 3632.
View of Pennsylvania Avenue, Washington, Looking Toward the Capitol 3680.
The United States Capitol at Night 3681.
A Famous Home of Science 3682.
An Airplane View of the Heart of Washington, D.C. 3683.
Mirror Lake with the Snow-Clad Peak of Mount Rainier 3686.
The Historic Executive Mansion 3734.
The Glory of "Old Faithful" 3819.
A Rainbow in Stone in Yellowstone Park 3829.
Looking Across Charming Mura Lake in the Yosemite Valley 3831.
An Alaskan Totem Pole 74.

## CANADA

Farm Life in Central Alberta 83.
A Sentinel Peak of British Columbia 511.
Victoria, Capital of British Columbia 512.
One of Canada's Many Beautiful Lakes 600.
Another View of Lake Louise 602.
Climbing the Robson Glacier 602.
A View in a Canadian National Park 603.
The Largest Grain Elevator in the World 604.
In a Nova Scotia Apple Orchard 604.
Life on Canada's Great Wheat Farms 605.
Riding Logs in New Brunswick 606.
A Logging Train on Vancouver Island 606.
How the Forest Giants of Canada Grow Up 607.
Codfish and Salmon from Canadian Waters 608.
A Moving Picture Flight over Canada 609.
Where Copper is "Cooked" from Canadian Ore 610.
Picturesque Quebec from the St. Lawrence 618.
Where the Dominion's Laws are Made 621.
A Hunter's and Fur Trapper's Cabin in Northern Canada 1389.
Camouflage and Strategy of the Seal Hunter 1176.
An Eskimo Mother and Baby Eskimo 1177.
A Deserted Village in Eskimo Land 1175.
At the "Timber Line" in Labrador 1948.
The Land-Locked Harbor of St. Johns 2450.
As in the Days of 'Evangeline'—Nova Scotia 2538.
An "Elevator" for Ships 2583.
An Asbestos Mine in Quebec 2946.
Power to Turn a Million Wheels 2947.
Where Quebec Province Makes Her Laws 2948.
Magnificent Chateau Frontenac on Dufferin Terrace 2949.
Canada's Great Highway to the Sea 3108.

## MEXICO, CENTRAL AMERICA, WEST INDIES

Buildings that Tell Us of Mexico's Vanished Civilization 289.
The Great Aztec Calendar Stone 289.
The Aztec God of the Winds 290.
One of the World's Richest Treasure Lands 2209.
Among the Poor Peons 2210.
One of the Favorite Sports of Mexico 2211.
A River Scene in Mexico 2212.
The Silver-Made City of Guanajuato 2213.
A Whole Lake of Rich Oil in Mexico 2214.
The National Beverage of the Mexicans 2215.
Relics of an Ancient Race 2216.
The Great Cathedral of Mexico City 2217.
Where the President of Mexico Lives 2218.
In the Heart of Mexico City 2219.
The Great Cerro Azul Gusher in Mexico 2749.
The Island Capital of Porto Rico 2886.
A Porto Rican Tobacco Field 2887.
Where the Backbone of America Stands Alone 680.
A Glimpse into the Early History of Central America 681.
The Ox Teams of Costa Rica 896.
Havana Streets 936.
It Looks Like Snow, but It's a Tobacco Field 937.
One of Cuba's Toy Railroads 937.
In the Capital of the Haiti Republic 1561.
Looking Down the Prado in Havana 1600.
Typical Products of Jamaica 1860.
Municipal Building in Panama City 2649.
A Native Village on the Banyano River 2649.
Busy Workers on Culebra Cut 2653.
One of the Giant Locks at Gatun 2654.
Cleaning up the City of Colon 2655.
General View of the Gaillard or Culebra Cut 2656.
The Gatun Locks in Operation 2657.
Opening the Spillway at Gatun Dam 2658.
Where the Canal Gets Its Water 2659.
View from Miraflores Locks 2659.
How the Great Locks Work which Lift the Ships from Ocean to Ocean 2660–1.
Where the Atlantic is West of the Pacific 2662.

## SOUTH AMERICA

The Great Basin of the Amazon 105.
Fresh Milk for Sale in South America 3288.
A Bird-Catcher from South America 3325.
Varied Types of South Americans 3287.
Argentina and Her Treasures 191.
The Wonder City of South America 526.
Rio de Janiero, with Sugar Loaf Peak in the Foreground 3284.
The Largest Lake in South America 448.
La Paz, the Capital on the Roof of Bolivia 449.
South America's Largest Country 494.
Shipping Port for the Coffee Bean 495.
A Coffee Plantation in Brazil 822.
In the Brazilian Jungle 3285.
In the Brazilian Home of the Fine Arts 3288.
The "Comforts of Home" in Tierra Del Fuego 736.
How Chile's Hungry Desert Feeds the World 737.
A Scene in Chile's Capital 738.
How Colombia Straddles South America 835.
The Gateway to Ecuador 1079.
The Three Guianas 1547.
The Capital City of Paraguay 2676.
In the Ancient Capital of Incas 1741.
These Two are "Chunchos" 2741.
The Strip Between Sea and Mountains 2741.
On the Roof of the Andes 2742.
One of the Oldest Cities in the New World 2743.
Peru and Its Enormous Mountain Chains 2744.
Caracas Perched High Among the Mountains 3621.
Venezuela and Her Liberator 3622.

## EUROPE

The Eiger, Moench, Jungfrau, and Matterhorn 102.
A Gem in Europe's Mountain Crown 1189.
Canterbury Cathedral, Glorious Monument of Faith 637.
Looking Across the Heart of Edinburgh 1082.

Ancient Travelers of Old British Roads 1151.
The Chief Castle of England's King and Queen 1154.
Typical Scenes of the English Countryside 1155.
Picturesque Chester and Its Curious "Rows" 1157.
Lincoln and Its Great Cathedral 1161.
Glimpses of Ireland's Famous Flax Industry 1291.
The Partnership of Glasgow and the Clyde 1470.
Going to the Creamery in Ireland 1807.
A Peasant Farmer's Cottage on the "Old Sod" 1808.
Bits of Ireland, North and South 1809.
Looking North in Sackville Street, Dublin 1810.
The Seat of the "Blarney Stone" 1810.
A Glimpse of Killarney's Famous Lakes 1811.
Where Liverpool's Fortune Lies 2031.
Where Great Britain's Laws are Made 2049.
The Throbbing Center of the British Empire 2051.
Trafalgar Square and the Nelson Monument 2052.
Fleet Street, London's "Newspaper Row" 2053.
The Most Popular "Circus" in London 2055.
An American among England's Heroes 2055.
The Historic Tower of London 2056.
Architectural Beauties of Oxford 2609.
View across Loch Lomond in Scotland 3146.
The Giant of Scotland's Mountains 3147.
The Royal Castle of Balmoral 3147.
Majestic Architecture Not Built with Hands 3148.
In the Picturesque Welsh Hills 3664.
Carnarvon Castle in Wales 3665.
Historic Spots in Picturesque France 1342.
A Roadside Shrine in France 1346.
In the Land Where "Grown-Ups" Walk on Stilts 1347.
Making Work Pleasant in Brittany 1347.
Two Charming Bits of Southern France 1349.
In France's Famous Vineyards 1350.
Helping Nature Provide a Harbor for Marseilles 1578.
From the Balcony of the Cathedral of Notre Dame 2681.
The Great Arch of Triumph 2681.
The Place de la Concorde from Across the Seine 2682.
The French National Opera 2683.
A "Perfume" Farm in Sunny France 2728.
Overlooking the Blue Mediterranean at Monte Carlo 2313.
Bruges, the "City of Bridges" 374.
The Dogs that Bring the Milk in Belgium 374.
In the Heart of Old Antwerp 375.
The Trade Center of Belgium 376.
The Great Bell Tower of Bruges 519.
A Sacrifice to the Grim God of War—Ypres 3834.
The Home of Winter Sports 3413.
In the Valley of Countless Springs 3414.
Beautiful Lake Geneva and Its Lovely City 1411.
An Uphill Job for the Swiss Farmer 3416.
Spring's First Flower in Winter's Snow 3419.
Where Engineers Have Conquered the Alps 3420.
Tulip Beds and Tulip Bulbs in Holland 2441.
The Mint Tower in Amsterdam 119.
Little Holland and the Mighty Sea 1191.
In the Great Dutch City of Rotterdam 2440.
"Little Old Men" of the Netherlands 2440.
One of the Great Dikes that Hold Back the Sea 2442.
Canals in the Front Yards 2442.
A Bavarian Folk Dance 346.
In the Capital of the Former German Empire 385.
Cologne Cathedral and Its Heaven-Pointing Spires 834.
Peasant's Cottage in Germany 1439.
Hamburg, the Largest Seaport in Germany 1441, 1567.
The Home of the Kaiser in the Days of the Empire 1442.
The Famous Theater at Weimar, the "Athens of Germany" 1443.
One of the Great Steel Works of Germany 1444.
Beautiful Heidelberg, City of the Famous University 1445.
The Storied "Mouse Tower" near Bingen on the Rhine 1446.
Frankfort on the Main, a City of Old Tradition and Great Wealth 1447.
Sunday in a German Village 1448.
In the Heart of Munich 2369.
The Market Place in Nuremberg 2543.
Denmark's Sturdy Women 994.
Seeing the Sights in Copenhagen 995.
The Icelander and His Native Land 1723.
Young Icelanders 1724.
A Country School House in Norway 2530.
"Stray Shots" from the Camera in Norway 2533.
Where the Fingers of the Sea Grip the Land 2534.
Among Norway's Chief Cities 2535.
Curing Cod Fish at Hammerfest 2536.
Flying Without Wings in Sweden 3401.
Swedish Dancers in Native Costumes 3402.
Peasant Girls in Holiday Attire 3402.
The Children Take Care of the Live Stock in Sweden 3403.
Stockholm, "Venice of the North" 3405.
A Harvest of Whales off Spitzbergen 3724.
Men and Women Work Side by Side in Poland 2856.
A Frowning Castle of the Tyrol 270.
Peasant Scenes in Austria-Hungary 272.
Young Peasants in Holiday Dress 273.
A Typical Hungarian Farm House 1703.
The Highland Fields and Lofty Peaks of Tyrol 3574.
Trinity Column, in the Graben, Vienna 3642.
Summer Sunshine on the Bay of Biscay 1192.
The Frowning Guard at the Gate of the Mediterranean 1458.
In the Gardens of the Spanish Royal Palace 2110.
Once a Royal Castle in Portugal 2888.
If You Want Water You Go to the River and Get It 2889.
Farthest West on the Continent of Europe 2890.
An Ancient Oxcart Hauling Wine 2890.
A Peasant's House in the Portuguese Mountains 2891.
Memorial of Moorish Rule in Spain 3298.
Spanish Mules and Their Packs 3300.
The Gray Olive Groves of the Spanish Hills 3302.
The Ancient Fortress City of Avila 3303.
The Spacious Harbor of Barcelona 3303.
A Square in the Newer Part of Madrid 3304.
Bull Fighting, the National Sport of Spain 3305.
The Valley of Aran, High in the Pyrenees 3305.
Among the Famous Lakes of Northern Italy 1193.
The Church with Ninety-Eight Spires 1199.
One of Italy's Richest Gems 1201.
Looking Across the Heart of Florence 1294.
A Famous Church in Florence and Its Famous Tower 1834.
A Sunny Son of Sunny Italy 1838.
Industries of a Smiling Land 1839.
The Arch of Augustus at Rimini 1840.
The Beautiful Lake in the Snow-Capped Mountains 1841.
A Tenement Quarter in Picturesque Naples 1842.
From the Harbor of Genoa 1845.
The Beautiful City of the Dead in Genoa 1847.
Venice, the Beautiful City Born of the Sea 1851.
Cathedral of St. Mark 1197.
On the Grand Canal in Venice 3624.
In the Library of the Popes 2665.
The Leaning Tower and Cathedral of Pisa 2811.
A View of the Ruins of Pompeii 2875.
Splendors of Rome, Ancient and Modern 3051.
The Forum of Rome, Then and Now 3053.
"Father Tiber" on His Way through Rome 3054.
The Ancient and the Modern City in Panorama 3055.
The Baths of Caracalla 3057.
A Ruined Memorial of the Days of the Greeks 3229.
Vesuvius in Eruption 3635.
Familiar Scenes in the Balkan Lands 309.
The Black Sea and Its Changeful Disposition 434.
A Bulgarian "Taxicab" 532.
The City of Athens as It is Today 1527.
An Oil Vendor in Rumania 3081.
A Famous Church at Jassy 3082.
Saloniki, Queen of the Northern Aegean 3114.
View from the Galata Quarter of Constantinople across the Golden Horn 3557.
Where Delicious Fruit is Cheap 3558.
The Old-Fashioned Style of Veils 3559.
A Group of Turkish Children 3560.
Within the Walls of the Historic Kremlin in Moscow 2332.
The Finest Boulevard in Russia 2748.
In the Bleak Snow-Bound North of Russia 3085.
Russians of the Far South 3085.
A Train Across the Steppes 3086.
A Russian Peasant Cart 3086.
The Thatched Hut of a Caucasus Peasant Family 3087.
Gathering Wheat in the Good Harvest Days 3089.
Above the Clouds in the Caucasus 3091.
Peter the Great's "Window Toward the West" 3093.
"Holy Moscow," Mother City of all the Russias 3093.
The Great Bell Market at Nizhni-Novgorod 3094.
St. George's Hall, Kremlin Palace 3095.

## AFRICA

Big African Chiefs—Three of Them 33.
Forty Miles for Twenty Cents 34.
Society Notes from Darkest Africa 35.
Native African Blacksmith at Work 36.

Where Houses are Built Like Giant Hats 38.
Negro Types of Africa 3283.
The Hand of Civilization in Africa 39.
Victoria Falls, the Mightiest Cataract in the World 3640.
Living Cairo in a Cemetery of Dead Cities 32.
The Famous Pompey's Pillar in Alexandria 88.
Water Carrier in Cairo 566.
Part of Cairo's Transportation System 567.
The Great University of Mohammedanism 569.
From Cairo to the Pyramids 570.
Ancient "Shadoofs" and the Thirsty Fields 1093.
Farming in the Shadow of the Pyramids 1094.
When the Spouting Gates are Opened at Assuan 1096.
A Noonday Prayer at the Oasis 1097.
The Key to the Story of Ancient Egypt 1099.
Three Great Tombs the Pharaohs Built 2940.
The Avenue of the Sphinxes Today 1103.
An Egyptian Pylon and a Mummy 1104.
The Statue that Used to Sing 1105.
In the Great Hall of Karnak 1105.
The Beautiful Ruins of Philae 1106.
Barefooted Magnificence in Abyssinia 3.
Tunis, the Old City and the Modern City 3549.
Every Good Mohammedan Prays Five Times a Day 2275.
A Native of Algeria 97.
A Sandy Sea of Algeria 3122.
Shopping in Tangier 2328.
The Vast Waves in the Sea of Sand 3105.
A Fleet of "Desert Ships" Under Way 3106.
A "Walled City" in British East Africa 37.
A Tribal Ceremony in East Africa 1068.
Cape Town, Looking Across to Table Mountain 3279.
Home Life in Zululand 3280.
A Ferry on the Tugela River in Natal 3281.
Johannesburg, Center of the Gold-Mining Industry 3281.
Along the Waterfront of the City of Zanzibar 3837.
Hauling Freight in Madagascar 2105.

## ASIA AND EAST INDIES

Seven Striking Facts about Asia 227.
A Picture-Journey from the Himalayas to Java 229.
A Caravan in the Desert 233.
The "Simple Life" in Siberia 3228.
Russia's Great Gateway on the Pacific 3652.
A Scene in Old Japan 1862.
An Avenue of Trees in Nikko 1863.
"The Great White Way" of Tokyo 1865.
In the Business Section of Tokyo 1865.
In the Land of Volcanoes 1866.
Mountain Climbing De Luxe in Japan 1867.
Japanese Children Winding Silk 1868.
Workers in Metal and a Maker of Wooden Shoes 1869.
A Group of Japanese School Girls 1871.
A "Peep Show" Movie in Japan 1872.
Japanese Ivory Carvers 1873.
The Giant Buddha of Kamakura 1876.
The Koreans Seem to Like Thatched Roofs! 1943.
The Textile Industry in Korea 1944.
The Former German City of Kiaochow 3196.
On a Japanese Tea Farm 3446.
The Great God Buddha in Many Moods 638.
A Chinese Taxi—Fare One Cent 638.
A Sacred Road Near Peking 739.
The Mighty Wall of Shi-Hwang-Ti 741.
Some Chinese Types 742.
In China They Call this a "Street" 743.
Chinese that "Go Boating" for Life 745.
The Simple Life in Walls of Mud 745.
Where Chinese Students were Examined 746.
You're Still in China—but Would You Know It? 747.
The American Consulate at Mukden 747.
Basketball and Civilization for Chinese Girls 748.
Perhaps Wung Foo Now Lives in a House Like This 750.
These Birds Catch Fish for Their Masters 751.
Mere Babies are Set to Work in China 751.
Part of Hongkong's Business Section 1678.
The "Front Gate" of Peking 2707.
A Modern Business Street and an Ancient Temple 2708.
How Tibetans Grind Their Grain 3496.
The Palace of the Dalai Lama at Lhasa 3496.
The Tibetan's Friend 3827.
The Holy City of the Hindus 381.
A Church that Rocks with the Wind 541.
Delhi's "Perfect Tower" 989.
The Great Mosque of Shah Jehan 990.
A Village on the Slopes of the World's Loftiest Mountains 1650.
The Dream-Like "Hall of the Winds" 1742.
Pilgrims Bathing in Ganges 1743.
A Home on the Mountain Border 1745.
In the Streets of Jaipur 1746.
Like a Bird in a Cage 1747.
A Snake Charmer at Work 1747.
Untamed Afghans and Hindu Hill People 1748.
The Giant Bull of Siva with the Haughty Air 1749.
The Stone Bull's Living Brother 1749.
A Curious Way to Cure the Toothache 1750
An Upturned Hindu Saint 1750.
Where Dancing is a Religion 1751.
Rajput, Brahman, and Parsee 1752.
A Tomb as Beautiful as a Jeweled Crown 1754.
Like a Cluster of Pearls on a Crystal Mirror 1755.
The Nizam of Hyderabad Paying Homage 1756.
A Beautiful Dream in Marble 3431.
A Malay Merchant and His Fruit Stand 2129.
On the Sunny Water Front of Singapore 2130.
Malay Girl and Baby 2131.
Picking Peppers Near Singapore 2723.
"A Flying Angel" and a Siamese Freight Train 3227.
Malay Girls "Panning" Tin 3504.
They've Plowed this Way for 2000 Years 2734.
How Persians Make Butter 2734.
Costumes and Customs in Persia 2735.
One of Teheran's Famous Porcelain Gates 2736.
A Valley in Arabia and Its Terraced Fields 166.
An Arab at a Public Watering Place 167.
In the Land of the Armenians 212.
The Bagdad of the 'Arabian Nights' 304.
The "City of the Dead" in Damascus 955.
Talking Politics and High Prices in Damascus 956.
The Famous "Blades of Damascus" 957.
A View of Modern Jerusalem 1885.
Wailing Place of the Jews and the Garden of Gethsemane 1886.
When the Pilgrims Come to Holy Mecca 2186.
On the Shores of the Tigris 2200.
On the Banks of the Sacred River Jordan 2644.
A Samaritan Reading the Law 2644.
On the Sea of Galilee 2645.
The City of Nazareth as It Looks Today 2646.
Down to the Plain of Sharon, 3000 feet below Jerusalem 2646.
The Road into the Land of Canaan 2647.
Temple of the Sun at Palmyra 2648.
A Street in Aleppo 3425.
The Sacred Lions of Java 1877.
A Great Picture Bible of the Buddhist Faith 1878.
Tropical River Scene in the "Pearl Island" 1878.
Ministers of the Sultan of Java Watching a Parade 1879.
"Gun Boys" of New Guinea 2451.
"Head-Hunters" now Guardians of the Peace 2451.
Like the Nests of Giant Birds 2452.
Civilization and Dress in the Philippines 2765.
The Filipino's "Auto" 2765.
Homes and Habits of the Filipinos 2766.
Mrs. Igorot and Her Rice Field 2766.
The Terraced Rice Lands of the Mountain Regions 2767.
In Manila's Chief Business District 2768.
What the Schools Do for the Filipinos 2769.

## AUSTRALIA AND PACIFIC ISLANDS

Native Australian Gentlemen 262.
The Wild Dancers of Queensland 2119.
Chief Sources of Australia's Wealth 263.
Wheat Awaiting Shipment at Melbourne 264.
Washing Gold Out of the Sand 265.
Old England in the New Land 268.
In the Charming City of the Yarra River 2195.
A Glimpse of the "Blue Mountains" 2471.
The Beautiful Capitol of Tasmania 3439.
New Zealand Natives and Their Homes 2499.
How Dunedin was Made to Order 2500.
What an Australian Can Do with a Boomerang 465.
Teaching the "Blackfellows" in Australia 3141.
Hawaiian Rice Field 1601.
Kilauea and Its Lake of Fire 1602.
A Roaring Lava Fountain in Kilauea Crater 3660.
A Little Kanaka—Hawaiian Islands 1603.
Views in and near Honolulu 1603.
Where the Delicious Pineapples Grow 1604.
The "Outrigger" Canoes of the Islanders 2618.

A Samoan Warrior on Dress Parade 2618.
The Mysterious Stone Men of Easter Island 2619.
A Houseboat of the South Seas 2620.
A Girl of Tahiti 2621.
Royalty in the Pacific 2621.
Games and Gambling in the Tonga Islands 2622.
The Pigs, the Chickens, and the Dinner Guests 2622.
The Big Baskets the Samoans Call Home 2623.
Dancing with the Hands Instead of the Feet 2624.
A Samoan Schoolhouse 3120.
Swordfish Attacking South Sea Islanders 3423.

### POLAR REGIONS

Amundsen and His Voyages at Both Ends of the Earth 120.
The Vast Antarctic Continent at the South Pole 144.
Story of the Search for the North Pole 189.
In the Far Northern Seas 2860.
On the March to the North Pole 2861.
At the Ends of the Earth—Victory at Last 2862.
An Eclipse Viewed from Near the Pole 2863.
"Castle Berg" and Its Shining Towers 2863.
Young Sea-Elephants and Royal Penguins 2864.

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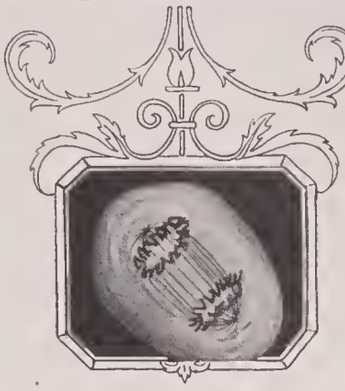
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Pacific Shores from Panama. E. Peixotto.
Porto Rico—Past and Present. A. H. Verrill.
Mexico. C. R. Enock.
Geographic Influences in American History. A. P. Brigham.
American History and Its Geographic Conditions. E. C. Semple.
Our American Wonderlands. G. W. James.
On the Great American Plateau. Theophile Mitchell Prudden.

# Interest-Questions in Geography

What does the name of the Himalaya Mountains mean? 1650.
Where are steamers found 12,644 feet above sea level? 2742.
How did a volcano preserve an ancient civilization for us? 2875.
Why does it rain only on one side of Porto Rico? 2885.
What regulates the rainfall? 2972.
How do we measure rainfall? 2974.
Why does Rhode Island concentrate on manufacturing? 3007–8.
What is the most important agent in shaping land surfaces? 3022.
Why is the Sahara a desert? 3104.
What makes sand? 3121.
Why do we know that the Sahara was once sea bottom? 3105.
How are wandering sand dunes kept at home? 3122.
Where do people really live in trees like birds? 2452 (picture).
Where is the land where "grown-ups" walk on stilts? 1347 (picture).
Where is the deepest hollow in the world? 227 (picture).
Why do the natives of Siam have red teeth and lips? 3226.
Where is the country of the "Sacred White Elephant?" 3226.
Why do people living in the Andes have to build one story houses? 3284.
Which is the greater: the height of the highest mountain or the depth of the deepest sea? 2617, 51 (picture).
In what country do members of the court go barefoot? 3 (picture).
Why can you enter Afghanistan only on certain days? 31.
Where can you dip fresh water from the Atlantic Ocean? 105.
What great continent lies uninhabited by man? 145.
How can boats float up stairs? 626.
In what city are there many floating homes? 639.
Which is the smallest independent country in the world? 1194.
Where does a railroad go out to sea? 1296–7.
In what lake is it almost impossible to drown? 1515.
Where is the oldest existing canal? 625.
Why is the Hwang Ho called the "Sorrow of China"? 1706.
How does a mountain reveal its age? 2358.
How does it happen that many people living on the Equator suffer from cold? 3285.
Where is ivory mined? 3228.
Where are the "Pillars of Hercules"? 1458.
Where is dancing a religion? 1751 (picture).
How did the Latin quarter of Paris get its name? 2682.
What country produces most of the world's diamonds? 41.
Where is the Painted Desert and what gives it its name? 200.
Where is there a great wall of ice 400 miles long? 145.
Where can you take a taxi for one cent? 638 (picture).
What island of the East Indies is long enough to reach from Florida to Colorado? 2451.
What country doubled in size and population after the World War? 3080.
How can you tell that a Malay woman is married? 2130 (picture).
What makes a Geyser spout? 1454.
Why are there few good harbors on the east coast of the United States below New York? 2517.
How does it happen that North Carolina has two coastlines? 2518.
What made Niagara Falls? 2503.
How were the Bad Lands made? 3296.
What state separates lakes Michigan, Superior, and Huron? 2223.
Why is a rain storm feared in Lima, Peru? 2009.
What queer lake helps us to pave our streets? 3541.
What is the mightiest waterfall in the world? 3640.
What is the city to which no Christian goes? 2187.
What is the name of the northernmost town in the world? 2534.
Where is there danger of falling up? 2556.
What keeps the temperature of the oceans low? 2559.
Where does most of the world's nickel come from? 2582.
What country is the holyland of three religions? 2643.
Why does the Dead Sea deserve its name? 2644.
In what distant country do we get most of our platinum? 2832.
Where does the rainfall amount to 50 or 60 feet a year? 1747.
Where do birds catch fish for their masters? 751 (picture).
What tiny island was called the Gibraltar of the North Sea? 1629.
Where does there still live a race of pigmies? 38.
Why is Europe called a peninsula of peninsulas? 1188.
Where is the Atlantic west of the Pacific? 2662 (picture).
How does infertile Chile make the world fertile? 736.
Why did Africa remain a dark continent so long? 33–4.
Why is it possible to grow strawberries in Alaska? 76.
What part of the United States is still a country of stage coach and dog-sled? 79.
What region leads the world in volcanoes? 679.
Why did Chicago turn her river around? 723.
How does manufacturing help to make fogs? 1316.
Why is the Red Sea red? 2822.
In what continent did the human race probably originate? 2133.
What is the "Dead Sea" of the New World? 1515.
What South Sea Island was the first to be discovered by white men? 1545.
What American city is the "rubber capital" of the world? 69.
What great manufacturing center of the United States is situated in Alabama? 70.
What causes earthquakes? 1064.
In what part of the world is "today yesterday and yesterday today"? 79 (picture).
What single river basin is almost as large as the United States? 105 (picture).
Which is the longest mountain system on earth? 122.
How did a cruel robber chief give Antwerp its name? 152.
What country is supported by gambling? 2313.
What North American seaport is nearly 1,000 miles from the sea? 2317.
What country has almost as many canals as railroads? 2438.
What French port was benefited most by the opening of the Suez Canal? 2154.
What American city gave its name to the fastest type of commercial sailing ship? 2162.
What American state was founded as a refuge for persecuted Catholics? 2163.
What states are separated by the "Mason and Dixon" line? 2164.
What state produces almost half the shoes used in the United States? 2165.
Where is the largest watch factory in the world? 2166.
What city is the greatest "mill town" for textiles in America? 2166.
How did her rivers shape the economic life of Massachusetts? 2169.
What kingdom is political ruler of Mecca? 2187.
Where is meerschaum found and where manufactured? 2194.
What sea was the first to be navigated by white men? 2194.
What is the "Levantine Sea"? 2194.
What town is the center of America's greatest muskmelon district? 2195.
What European country grows many watermelons? 2196.
Why is Mesopotamia, once a garden spot, all but desert now? 2200.
What important French river flows through a natural tunnel for three miles? 2207.
What country is probably the richest in undeveloped mineral resources? 2208.
Where do we get binder twine for American harvesting machines? 2214.
Which American state has the longest coast line? 2223.
What American state furnishes most of the world's peppermint? 2224.
What city is called the "automobile capital of the world"? 2224.
What city is the world's greatest flour center? 2252.
In what state do the iron mines contribute directly to the support of schools? 2256.
What river of the United States maintains its surface higher than the land on either side? 2266.
In what American state is it said that "east meets west, and north meets south"? 2270.

# BIOLOGY







THE most wonderful thing in the world is Life. Since the earliest days of civilized thought philosophers have wondered at its manifold problems and have sought in vain to penetrate its mysteries. What is Life? What is that magic thing, possessed alike by the tiniest plant and the greatest genius among men, which serves to set them apart from the "dead" rock of the hillside? We are perhaps very little nearer to a final definition of Life than were the old Greek sages. Yet of the facts *about* Life we know vastly more. It is with these facts that Biology deals. It was not until the beginning of the last century that Biology was organized definitely as a separate science. About that time the knowledge of Botany and Zoölogy, Anatomy and Physiology had developed far enough to suggest to scientists that certain great principles must run through *all* forms of Life, whether plant or animal. Setting about to discover and formulate those principles, they founded the science of Biology.

In the earlier Outline on Nature Study we have examined many of the most interesting and significant facts about plants and animals, without, however, emphasizing any general biological laws. Here we shall survey briefly the scope of Biology as a science, and examine some of the more important characteristics common to all forms of life, without attempting to go far into technical details. Following this general survey, the student will find, under "Botany" and "Zoölogy," scientific classifications of plants and animals, so arranged and explained as to bring out many of the significant relationships existing between the members of each group.

## I. THE SCOPE OF BIOLOGICAL SCIENCE:

**A. Biology is the Science of All Life: 393.**

**a. Botany is Biology Applied to Plant Life (473); Zoölogy is Biology Applied to Animal Life (3841).**

**b. Relations of Biology to Other Sciences:**

1. **Chemistry** supplies data and methods for studying substances involved in life (food, tissues, fluids, such as blood and the saps of plants). An example is the chemistry of digestion (1010). This aspect of chemistry is often called Organic Chemistry (714), or because carbon occurs so universally throughout living tissues, the Chemistry of Carbon Compounds (642). A more definite term—**Biochemistry**—is coming into use, however, to describe the specific chemistry of life's processes.
2. **Physics** supplies data and methods for studying the effects upon life of physical states and forces, such as light, heat, electricity, etc. For instance, Physics helps to tell why sap rises (2825, 2823 picture).
3. **Geology** supplies data concerning how the "life environment," that is the earth's crust, the air, the waters of the earth, came to have its present form. It helps to trace the history of life by studying the age of fossils (1322, 1209, 1418). This union of Geology with Biology is often given a separate name—**Paleontology** (1336).

**B. Chief Subdivisions of Biology:**

a. **Cytology** deals with the composition and structure of Cells (671), the basic units from which all living things are built; **Histology** (121) deals with the manner in which these Cells are organized into living tissues; **Anatomy** (121) investigates the arrangement of tissues into organs, and the arrangement of organs in the living organism.

b. **Embryology** (1140) studies the development of individual organisms from the first single cell; **Morphology** (121) applies the principles of the foregoing branches to a study of the causes governing the structure and forms of all living organisms; **Physiology** (2792) investigates and describes the functions of the parts of the organisms.

c. **Ecology** (1076) deals with the relations of plants and animals to their environment, the effects of climate, etc.

d. **Genetics** (398, 473) includes the study of the laws governing heredity in plants and animals. **Eugenics** (1187) is a branch or outgrowth of Genetics.

*consult the Easy Reference Fact-Index at the end of this work*

II. BIOLOGY'S TEACHINGS—THE LIFE PROCESS:

A. Things Necessary to Life:

a. **Chemical Elements:** From 12 to 16 elements only, out of the 82 elements of which the earth is composed, are required by living organisms (394). These are Carbon, Oxygen, Hydrogen, Nitrogen, Iron, Sulphur, Phosphorus, Chlorine, Potassium, Sodium, Magnesium, Calcium, Manganese, Fluorine, Silicon, and Iodine.

b. **Water Essential to Life: 3693.**

c. **Heat and Light Essential to Life: 2000.**

B. Combination of Matter into Life Forms:

a. **The Cell is the Combining Unit:** The Cell is the unit of all tissue (398, 671). Many primitive plants and animals consist of single cells, as Amoeba (118), Bacteria (302). Higher forms start as single cells in the reproductive process and grow by cell-division (394, 395 picture).

b. **Chemical Nature of Cells:** Protoplasm (2926) is the universal material (2926). Plant structures are stiffened with Cellulose (673), Animal structures usually with compounds of Calcium and Silicon.

c. **Basic Chemical and Physical Processes:**

1. Life materials are obtained from lifeless air, earth, and water by the process of "Photosynthesis." This is the scientific name of the process by which plants with the aid of sunlight use their green coloring matter (chlorophyll) to extract carbon from the carbon-dioxide of the air, and then combine that carbon with the minerals and water from the earth to manufacture the materials from which plant cells are built (2823, 1980).
2. Plants alone possess the chlorophyll necessary for Photosynthesis. Animals live directly or indirectly on the food manufactured by Plants.
3. Many life processes are carried out through the action of Enzymes (1173).

d. **Food Absorption and Conversion:**

1. Single-Celled Animals and Plants obtain their food by absorbing it through the Cell walls (118). Many-celled types usually have some kind of container into which food is drawn and held while being absorbed.
2. Chemical Nature of Food Conversion—by chlorophyll in Plants (2824); by digestive ferments in Animals (1010).

e. **Distribution of Food:**

1. Circulation of sap in higher Plants: 2825, picture 353[1]
2. Circulation of blood in Animals: 437.

f. **Respiration Necessary to All Forms of Life: 2998, 2824.**

g. **Indirect Ways of Obtaining Life Substances:**

1. **Parasitism,** living upon body material of another living organism: 2677, 2823. Typical parasites among worms (3813, 396); among plants (rusts and smuts 3099). Usually accompanied by degeneration of the Parasite (2678).
2. **Saprophytism,** living upon material of dead organisms: 2823. Mushrooms (2374) are typical plant saprophytes. In one sense, of course, all animals, living as they do upon the food manufactured by plants, are Saprophytes.
3. **Symbiosis,** combination of two forms of life into a partnership, each carrying on a separate share of the life process. The Lichens (1994) are examples. Sometimes the partners are called Commensals or "messmates" (912).

h. **Disposing of Used and Waste Materials:**

1. **By excretion: 1011, 1922.**
2. **By respiration: 2998.**

C. Organization of Life Processes:

a. **Life Processes are Carried Out Only through Individual Organisms:** It is characteristic of all the phenomena of life that they are invariably found associated with individuals *functioning as units.* The parts of each unit are so coördinated that they act together toward a common end.

b. **Coördinating Mechanism of Plants:** Little is known of the forces which control this feature of plant life. The manner in which the various parts of a great tree, for instance, "communicate" with each other so that each performs its proper part in relation to the whole tree is still a mystery: —Evidence of Delicate Coördination in Plants: 2828, 2824 picture; Sensitive Plant 2829.

c. **Coördinating Mechanism in Animals:** The very low types of animals, such as Sponges, present the same mystery in this respect as do plants. But, beginning with the Jelly-fish, there appears a distinct equipment definitely suited for the coördinating process—that is a Nervous System.

1. Nerves and Their Work: 2436.
2. Nervous Systems of Higher Animals Culminate in the Brain: Man's brain (486) is the highest development of the coördinating mechanism.

D. Reproduction of Life:

a. **Asexual Reproduction:** This consists of a simple division of the single organism into two parts. This type of reproduction is found only among lower organisms such as Bacteria (303), Amoeba (119). It may take place either:

1. **By Fission** or "splitting apart" into two equal or nearly equal parts, as in the case of Amoeba and of many Bacteria, or

2. **By Gemmation,** also called "budding" or "sporing," in which the original organism puts forth a "bud" or "spore" which grows and eventually comes away. Yeast (3828 picture) is an example.

b. **Sexual Reproduction:** This type requires two parent bodies. It consists of the union of two reproducing cells or **Gametes,** one from each parent. Often the two parent bodies are found upon the same individual, as in the case of most flowers (1304).
1. Male cell is called Sperm.
2. Female Cell is called Ovum or Egg.

c. **Reproduction by Alternating of Generations:** Many organisms reproduce by a process which combines the asexual and the sexual method. The process in plants consists of (1) the asexual production of a spore; (2) the growth of the spore into a "gametophyte" or sex plant; (3) the sexual production by the gametophyte of a "sporophyte" or non-sexual plant, which in turn produces spores again by the asexual process. Examples of this process seen in Mosses (2338) and Ferns (1232).

E. **Development of New Life:**
a. **Embryology: 1140.**
b. **Egg: 1090: Seeds and Spores 3171.**

III. **HISTORY OF LIFE:**
A. **Evolution: 1208.**
a. **Darwin's Theory: 963.**
b. **What Geology Tells Us of Evolution: 1418.**
—The Story of Fossils: 1334.
c. **Some Examples of Evolution:** Horse (1682), Elephant (1126 picture), Flatfish (1289).
—Survival of primitive types: Marsupials as examples (1908).
B. **Heredity and what It Means: 1641.**

# BOTANY

## Classification of Plants

COUNTLESS difficulties confront botanists in the classification of plants and the various writers on the subject differ in their arrangements in many points. But such differences are not important to the general student. The classification made here is based upon the work of the most recent authorities. It does not pretend to be complete, but to include only those groups which are either of great scientific importance or well known to the general public.

The group names used in the descending order are Phylum, Sub-phylum, Class, Order, Family, Genus. In each case the Phylum is indicated by a Roman numeral (I, II, III, etc.), the Sub-phylum by "Sub-ph.," and the others by the following abbreviations: "Cl., Ord., Fam., Gen." An explanation of the meaning of these group names is given on page 412.

I. **THALLOPHYTES:** Simplest plants, usually distinguished by having a "thallus" body, that is a body which has no differentiated organs such as flowers, sap fibers, leaves, roots, etc. Forms range from microscopic size to such enormous growths as the giant kelp. Most types reproduce asexually, that is by simple division, but higher types have primitive sexual characteristics.

Sub-ph. **ALGAE: 90.** Includes those Thallophytes which have green coloring matter (chlorophyll). Regarded as ancestors of all higher plants.

Cl. **Chlorophyceae:** "Green Algae"; simple one-celled forms; they contain no coloring matter other than chlorophyll (92).

Ord. **Volvocales:** Single celled plants capable of moving about with the aid of "cilia" or vibrating hair-like organs. Often gathered in colonies in ponds. Reproduction is sexual. Zoologists usually class some of these forms as animals in the group Flagellata. Typical genus: *Volvox.*

Ord. **Protococcales:** One-celled, asexual, motionless forms. Typical genera: *Pleurococcus,* Green Slime, often found in colonies on damp stones, tree trunks; *Hydrodictyon,* Water Nets, forming net-like colonies sometimes a foot long.

Ord. **Confervales:** Many-celled body, branching or sheet-like. Reproduction is sexual. Typical genera: *Ulothrix,* a fresh-water form which reproduces by pairing gametes or sexual cells of similar stucture; *Oedogonium,* a fresh-water form with gametes differentiated into egg and sperm cells; *Ulva,* Sea Lettuce (3170 picture).

Ord. **Siphonales:** Lack of cross-walls in body gives continuous cavity. Typical genus: *Vaucheria* (pond-scum, often called "green felt").

Ord. **Conjugales:** Reproduces by sexual gametes which fuse through tubes instead of swimming toward each other. Typical genus: *Spirogyra,* pond-scum which gathers into delicate filaments (92).

Ord. **Charales:** "Stoneworts"; grow on bottom of ponds. Thallus has definite points from which branches and reproducing cells originate.

Cl. **Rhodophyceae:** "Red Algae" (92); structure simpler than that of other algae, but sexual reproduction more highly developed.

Cl. **Phaeophyceae:** "Brown Algae," chiefly marine (92). Includes Ord. **Laminariales,** the Kelps; Ord. **Fucales,** the Rockweeds (3170 picture), and Gen. *Sargassum,* the Gulfweed (3170).

**Note:** The Class **Chaenophyceae** or so-called "Blue-green Algae" are placed by most recent botanical works in the Sub-phylum Schizomycetes, which includes also Bacteria. (See below.)

Sub-ph. **FUNGI: 1382.** Parasitic and saprophytic forms, lacking chlorophyll. Characterized by the **mycelium,** consisting of a network of thread-like filaments (hyphae) which permeate food supply, or give rise to the visible spore-producing organs. Believed to have degenerated from Algae, having lost their chlorophyll and hence their ability to manufacture their own food.

Cl. **Phycomycetes:** Resemble green algae; mycelium has continuous cavity, with no cross-walls. Includes Downy or "False" Mildews and Black Molds (2235).

Cl. **Ascomycetes:** Mycelium divided by cross-walls; spores borne in sacs. Includes Yeasts (3828), Morels (2375), Truffles (2375), Ergot (3102), and the true Mildews and Molds (2235).

Cl. **Basidiomycetes:** Spores borne on stalk called "basidia." Typical examples Rusts and Smuts (3099), Mushrooms (2374).

**Note:** The class **Myxomycetes** or Slime Molds are sometimes included with the Fungi because they possess spore cases. They do not, however, have the mycelium. The young swarm cells gather into amoeba-like groups, which leads some biologists to class them as animals under the name Mycetozoa (see Zoölogy Outline under division on Protozoa).

Sub-ph. **SCHIZOMYCETES:** Fission Fungi; single-celled body; reproduce by fission instead of "sporing." Includes Bacteria and "Blue-green Algae." Read also Germ Theory of Disease (1449).

**Note:** The **Lichens** are partnership plants, consisting of a Fungus which imprisons Algae, forming a combination that is mutually helpful. Lichens can be made artificially by placing the proper plants together. They are usually classified by means of the Fungus which enters into the combination. For instance, the genera *Parmelia* and *Physcia* are **Ascolichenes,** because the Fungus is an Ascomycete.

**II. BRYOPHYTES:** Forms evolved from Green Algae and adapted to land life. Characterized by well developed "alternation of generations," in which the gametophyte (plant of the sexual generation) is the commonly visible form.

Cl. **Hepaticae:** Liverworts (2032) evolved from Algae and ancestors of Mosses; spore case opens by splitting.

Cl. **Musci:** Mosses (2338) evolved from Liverworts; spore case opens by means of a lid; plant differentiated into primitive stems and leaves. The Mosses are divided into three orders: **Sphagnales,** single genus *Sphagnum,* the Bog-mosses adapted to aquatic life; **Andreales,** rock-growing forms; **Bryales,** soil-growing forms, typified by genus *Funaria.*

**III. PTERIDOPHYTES:** This group is characterized by the appearance of a **Vascular Structure,** that is a system of vessels for conducting sap through the plant body. Reproduction is by alternating generations as in Bryophytes, but in this case the sporophyte (asexual generation) is the commonly visible form. The class relationships between the members of this phylum are still obscure. There are, however, three distinct orders:

Ord. **Equisetales:** Composed of only one genus, *Equisetum,* the Horsetails (3083, 1234); stems jointed; leaves grow in whorls, being united in each whorl into a sheath.

Ord. **Lycopodiales:** Club-mosses (1234); have slender branching stems, completely clothed in small foliage leaves, having a general moss-like appearance.

Ord. **Filicales:** Ferns (1232); large leaves which bear spores in "sori" or spore-cups on their under surface. Divided into two sub-orders: **Filicineae,** the true Ferns, and **Hydropteridineae,** the Water Ferns.

**IV. SPERMATOPHYTES:** Seed Plants, that is plants in which the fertilization of the female cell by the male cell results in the production of a **Seed,** as distinguished from the three preceding groups which either reproduce by simple division or which grow directly from the union of two spores (3173). Spermatophytes are divided into two great sub-phyla: (1) the **Gymnosperms** or "naked-seeds," referring to the fact that the seeds are always exposed; and (2) the **Angiosperms** or "enclosed seeds" indicating that the seeds are inclosed in a seed vessel. The former are regarded as the more primitive types.

Sub-ph. **GYMNOSPERMS:**

Ord. **Cycadales:** Cycads (3533); fernlike tropical types, strongly suggesting the probable fern ancestry of all Gymnosperms. Single stem, crowned by few large leaves. Typified by genus *Zamia* (American) and *Cycas* (Asiatic).

Ord. **Ginkgoales:** Typified by genus *Ginkgo,* the Ginkgo (1460).

Ord. **Coniferales:** Conifers; temperate types; long straight trunk; cone-bearing, and usually evergreen, with needle-like leaves.

Fam. **Pinaceae:** Ovules protected by overlapping scales; seeds ripen dry. Includes the following genera: *Pinus,* Pine (2807); *Abies,* Fir (1248); *Picea,* Spruce (3332); *Tsuga,* Hemlock (1629); *Sequoia,* Sequoias, Redwoods (3175); *Juniperus,* Junipers (1902, 671); *Cedrus,* Cedar (670); *Larix,* Larch (1962); *Thuja,* Arbor Vitae (671, 670, picture); *Cupressus,* Yellow Cedar, Lawson Spruce (946); *Taxodium,* Bald Cypress (946); *Taxus,* Yew (3830).

Fam. **Taxaceae:** Ovules often unprotected by scales; seeds frequently ripened in fleshy capsules. Found in Southern hemisphere, where they take the place of conifers of the North. Principal genus, *Podocarpus.*

Sub-ph. **ANGIOSPERMS:** The highest of the great plant divisions. Members of this group have true flowers; seeds are enclosed in seed case. Angiosperms fall into two great classes: **Monocotyledons,** whose seeds contain but one "cotyledon" or seed-leaf, and **Dicotyledons** whose seeds contain more than one "cotyledon."

**Note:** The classification of Angiosperms depends chiefly upon the development of their flowers. They are ranked according to variations in the following characteristics:

**A.** The **perianth** which consists of the corolla formed by the petals and of the calyx formed by the sepals (1305). The perianth may be lacking altogether; or there may be a **"bracteate"** perianth, composed of bracts or sheaths protecting the flower; or there may be a true perianth, composed of both corolla and calyx.

**B.** The parts of the flower may be distributed about their axis in a spiral of varying length, in which case the flower is said to be **"spiral";** or they may be arranged in definite cycles of regular pattern, in which case the flower is said to be **"cyclic."**

**C.** The sepals, petals, and stamens may arise from beneath the ovary, in which case the flower is **"hypogynous";** or they may arise from the side of the ovary, in which case the flower is **"perigynous";** or they may arise from above the ovary, in which case the flower is **"epigynous."**

**D.** The carpels (consisting of the ovaries and pistils) may each be separate from the other, in which case the flower is **"apocarpous";** or the carpels may unite to form a single compound pistil, in which case the flower is **"syncarpous."**

**E.** Each petal may be separate, in which case the flower is **"polypetalous";** or the petals may fuse into a tubular corolla, in which case the flower is **"sympetalous."**

**F.** When stamens and pistils exist in the same flower, it is **"bisexual";** when they exist in separate flowers, those flowers are **"unisexual,"** one flower being **"staminiferous"** or male, the other **"pistilliferous"** or female. When male and female flowers are found on the same plant, the plant is **"monoecious";** when on separate plants, the plants are **"dioecious."**

Cl. **Monocotyledons:** Seeds have only one cotyledon; flowers spiral or cyclic; vascular tissue (3532) usually scattered through the stems, instead of forming a tube or belt enclosing pith, as in the Dicotyledons; leaves are mostly parallel veined or "net-veined," that is the veins either start at the base and run to the tip without branching (1981 picture), or they form a closed network, while in the leaves of the Dicotyledons, the veins usually branch out and end at the margin.

Ord. **Pandalales:** Spiral flowers; perianth lacking; all forms water-loving. Typical Example: Fam. **Typhaceae,** Gen. *Typha,* Cat-tail (3700).

Ord. **Glumales:** Individual flowers protected by bracts, called "glumes" in such a formation.

Fam. **Poaceae or Gramineae:** Grass family (1502); includes most cereal grains. Typical genera: *Avena,* Oats (2548); *Triticum,* Wheat (3730); *Secale,* Rye (3102); *Oryza,* Rice (3013); *Hordeum,* Barley (330); *Zea,* Corn (888); *Andropogon,* Kafir corn (1907), Sorghum (3276); *Panicum,* Millet (2239); *Bambusa,* Bamboo (323); *Saccharum,* Sugar Cane (3386).

Fam. **Cyperaceae:** Sedges (3171). Distinguished from grasses by solid leaf-sheath which encloses stem. Typified by genus *Carex,* Common Sedge.

Ord. **Palmales:** Consists of one family, **Palmaceae,** the Palms (2647); rudimentary perianth present; flower cluster sheltered by great bract. Typical genera: *Phoenix,* Date Palm (966); *Areca,* Betel (387); *Cocos,* Coconut (818); *Metroxylon,* Sago Palm (3104).

Ord. **Arales:** Flowers with highly specialized type of bract; broad, net-veined leaves.

Fam. **Araceae:** Arums, Typical genera: *Caladium,* Caladium (3700); *Richardia,* Calla Lily (2009).

Fam. **Lemnaceae:** Duckweeds (3700); stemless, whole plant resembling simple frond.

Ord. **Farinales:** Flowers of primitive cyclic form; bracts persist, but differentiated calyx and corolla appear in higher forms. Seeds starchy.

Fam. **Pontederiaceae:** Pickerel Weeds; aquatic, with sheathing leaves and perfect flowers developed from large bract. Typical genera: *Eichornia,* Water Hyacinth (1706); *Pontederia,* Pickerel Weed (3700).

Fam. **Commelinaceae:** Spiderweeds. Typical genus: *Zebrina,* Wandering Jew (3669).

Fam. **Bromeliaceae:** Bromelia family; most types air-living (epiphytic 69); leaves often scaly. Typical genera: *Tillandsia,* Spanish Moss (69); *Ananas,* Pineapple (2809).

Ord. **Lileales:** Perianth varies from primitive types in lower families to petal-like type in higher groups; seeds oily rather than starchy.

Fam. **Liliaceae:** Floral elements set below ovaries (hypogynous); regarded as more primitive than families following. Typical genera: *Lilium,* Common Lilies (2008); *Allium,* Onion (2581), Garlic, Leek; *Asparagus,* Asparagus (234); *Convallaria,* Lily of the Valley (2009); *Tulipa,* Tulips (3547); *Smilax,* Smilax, Sarsaparilla (3127); *Yucca,* Yucca, Bear-grass (3835), Spanish Bayonet; *Erythronium,* Dog-tooth Violet (1025); *Trillium,* Trillium (3540, 2854 picture).

Fam. **Juncaceae:** Rushes (3083). Flowers resemble lilies but are clustered; suited to wind pollination; leaves grasslike.

Fam. **Dioscoreaceae:** Tuber roots, climbing stems. Typical genus: *Dioscorea,* Yam (3406).

Fam. **Amaryllidaceae:** Amaryllis family, floral elements rise from top of ovary (epigynous). Typical genera: *Narcissus*, Narcissus, Jonquil, Daffodil (2397); *Agave*, Agave, Sisal (3244), Century Plant (42); *Polianthes*, Tuberoses (3547).

Fam. **Iridaceae:** Iris family; most highly specialized of Lileales; flowers epigynous. Typical genera: *Iris*, Iris (1814); Gladiolus (1466); *Crocus*, Crocus (923); *Hyacinthus*, Hyacinth (1706).

Ord. **Scitaminales:** Flowers have petal-like stamens; sheaths of leaves build up false stem.

Fam. **Musaceae:** Banana family. Typical genus: *Musa*, Banana (324).

Fam. **Cannaceae** or **Scitaminaceae:** Canna family. Typical genus: *Canna*, Canna (630).

Fam. **Zinziberaceae:** Ginger family. Typical genera: *Zinziber*, Ginger (1460); *Maranta*, Arrowroot (220).

Ord. **Orchidales:** Most highly specialized of all Monocotyledons. Most types contained in family **Orchidaceae.**

Fam. **Orchidaceae:** Contains "air plants" (epiphytes) and land forms, the latter usually saprophytic or parasitic. Most flowers have one petal developed into labellum, or "lip." Typical genera: *Orchis*, including many of the best known orchids (2593); *Cattleya* (2592, picture); *Cypripedium*, Lady's Slipper (1955); *Vanilla*, Vanilla (3619).

Cl. **Dicotyledons:** Plants whose seeds consist of two cotyledons. Vascular tissue (3532) forms tube or belt including central pith; leaves usually "open-veined," that is, veins end at edge of leaf.

**Note:** The Dicotyledons fall into two subclasses, (1) the **Archichlamydeae,** in which the corolla is either lacking (apetalous) or composed of several separate petals (polypetalous), and (2) the **Sympetalae** in which the petals are fused into a cup or tube at the base (sympetalous). The classification begins with the Archichlamydeae:

Ord. **Piperales:** Primitive form; naked flowers. Typified by family **Piperaceae,** genus *Piper*, Pepper (2723).

Ord. **Salicales:** The Willow order with one family; flowers grow on aments or "catkins," consisting of long, fleshy spikes bearing numerous simple flowers, each flower concealed by a horny sheath or bract.

Fam. **Salicaceae:** Typical genera *Salix*, Willow (3742); *Populus*, Poplar (2879), Aspen, Cottonwood.

Ord. **Juglandales:** The Walnut order, with one family. Flowers in catkins similar to willows, but show beginnings of petal and sepal structure; compound leaves (i.e., leaves composed of several leaflets).

Fam. **Juglandaceae:** Flowers monoecious (1305). Typical genera: *Juglans*, Walnut (3667), Butternut (548); *Hicoria*, Hickory (1647), Pecan (2705).

Ord. **Fagales:** Flowers in catkins similar to those of the Walnut order, but leaves simple (i.e., not composed of leaflets).

Fam. **Fagaceae:** Typical genera: *Fagus*, Beech (364); *Quercus*, Oak (2547); *Castanea*, Chestnut (718), Chinquapin (752).

Fam. **Betulaceae:** Typical genera: *Betula*, Birch (399); *Corylus*, Hazel (1611); *Alnus*, Alder (85).

Ord. **Urticales:** Perianth distinct but bracteate instead of having true petals and sepals; flowers cyclic.

Fam. **Urticaceae:** Nettle family; alternate leaves. Typical genera: *Urtica*, Nettle (2443); *Humulus*, Hop (1680); *Brosimum*, Cow Tree (3532).

Fam. **Ulmaceae:** Elm family; alternate, simple leaves. Typical genus: *Ulmus*, Elm (1138).

Fam. **Moraceae:** Mulberry family. Typical genera: *Morus*, Mulberry (2365); *Toxylon* or *Maclura*, Osage Orange (1627); *Cannabis*, Hemp (1630); *Ficus*, Fig (1237), Common Rubber Plant (3073), Banyan (329); *Castilloa*, Central American Rubber Tree (3072); *Artocarpus*, Breadfruit (501).

Ord. **Santalales:** Flowers cyclic as in above order but calyx and corolla are differentiated.

Fam. **Santalaceae:** Typical genus: *Santalum*, Sandalwood (3123).

Fam. **Loranthaceae:** Mistletoe family (2274); most members tropical and parasitic. Typical genera: *Viscum*, European Mistletoe; *Phoradendron*, American Mistletoe.

Ord. **Polygonales:** Flowers cyclic; "three part" perianth.

Fam. **Polygonaceae:** The Dock family. Typical genera: *Polygonum*, Knotweed; *Rumex*, Dock (3013); *Rheum*, Rhubarb (3012); *Fagopyrum*, Buckwheat (524).

Ord. **Centrospermales:** Transitional forms ranging from bracteate flowers of family **Chenopodiaceae** to completely developed corolla and calyx of **Caryophyllaceae.**

Fam. **Chenopodiaceae:** Goosefoot family; leaves adapted to avoid evaporation of water. Typical genera: *Chenopodium*, Goosefoot Weed; *Beta*, Beet (365).

Fam. **Phytolaccaceae:** Typical genus: *Phytolacca*, Pokeberry (2854).

Fam. **Amarantaceae:** Typical genus: *Amarantus*, Amaranth.

Fam. **Caryophyllaceae:** Pinks; flowers well developed with calyx tending to fuse into tube in some types. Typical genera: *Silene*, Fire Pink (2809); *Dianthus*, Pink (2809), Carnation (645), Sweet-William (2809).

Ord. **Ranales:** In this order are found primitive types, with apocarpous, hypogynous, and spiral flowers, and well developed types, with cyclic flowers having true perianth.

Fam. **Ranunculaceae:** Crowfoot family. Typical genera: *Ranunculus*, Buttercup (544); *Delphinium*, Larkspur (1963); *Paeonia*, Peony (2722); *Clematis*, Clematis (786); *Helleboras*, Hellebore (2852); *Aquilegia*, Columbine (846); *Hepatica*, Hepatica (1639); *Caltha*, Marsh Marigold (2155); *Aconitum*, Monk's Hood (2855); *Anemone*, (123).

Fam. **Berberidaceae:** Typical genera: *Berberis*, Barberry (1628); *Podophyllum*, May-Apples (2175).

Fam. **Nymphaeaceae:** Typical genera: *Nymphaea*, Yellow Pond Lily (3699); *Castalia*, White Water Lily (3699), Sacred Lotus (2063).

Fam. **Magnoliaceae:** Magnolia family. Typical genera: *Magnolia*, Magnolia (2123); *Liriodendron*, Tulip Tree (3547).

Fam. **Myristicaceae:** Nutmeg family; tropical trees and shrubs. Typical genus: *Myristica*, Nutmeg (2544).

Fam. **Lauraceae:** Laurel family. Typical genera: *Laurus*, Laurel (1970), Bay Tree; *Cinnamomum*, Cinnamon (3318); *Camphora*, Camphor (594); *Sassafras*, Sassafras (3129).

Ord. **Rhoedales:** Includes forms developed from Water Lily family, **Nymphaeaceae.** The Poppies (Fam. **Papaveraceae**) are the parent stock of the order, the other families having evolved from them. Flowers more advanced than most of the Ranales.

Fam. **Papaveraceae:** The Poppy family. Typical genera: *Papaver*, Poppy (2880); *Sanguinaria*, Bloodroot (438).

Fam. **Resedaceae:** Typical genus: *Reseda*, Mignonette (2230).

Fam. **Brassicaceae:** The Cabbage family (554). Typical genera: *Brassica*, Cabbage, Cauliflower, Turnip, Mustard, Brussels Sprouts (553); *Raphanus*, Radishes (553); *Lepidium*, Water Cress (553).

Ord. **Sarraceniales:** In this order are included many insect-catching plants.

Fam. **Sarraceniaceae:** American forms. Typical genus: *Sarracenia*, "Side Saddle" (2811).

Fam. **Nepenthaceae:** Asiatic forms; pitchers at tip of tendrils. Typical genus: *Nepenthe*, Pitcher Plant (2811).

Fam. **Droseraceae:** Leaves exude sticky fluid. Typical genera: *Drosera*, Sundew (3396); *Dionaea*, Venus's Fly-Trap (3626).

Ord. **Rosales:** This is the dominant order in the sub-class **Archichlamydeae,** with over 14,000 species. Flowers cyclic with traces of lower spiral form; fruits highly specialized. Types supposed to have evolved from Buttercup family, **Ranunculaceae.**

Fam. **Saxifragaceae:** Most primitive types; regarded as ancestors of other families in the order. Typical genera: *Saxifraga*, Saxifrage (3131); *Hydrangea*, Hydrangea (1708); *Philadelphus*, Syringa (3426).

Fam. **Rosaceae:** The Rose family. Typical genera: *Spirea*, Spirea (3327); *Rosa*, Rose (3066); *Fragaria*, Strawberry (3370); *Rubus*, Raspberry (2977), Blackberry (432), Loganberry (2046); *Prunus*, Apricot (161), Plum (2840), Peach (2699), Sloe (3251), Cherry (716); *Amygdalus*, Almond (99); *Crataegus*, Hawthorn (1607); *Cydonia*, Quince (2950); *Pyrus*, Pear (2701), Apple (160); *Sorbus*, Mountain Ash (2357).

Fam. **Fabaceae** or **Leguminosae:** Pod-bearing plants; roots often harbor nitrifying bacteria (302): Genus *Mimosa* is typical of the stock from which other types of Fabaceae evolved. This family is divided into three subfamilies according to flower structure.

Sub-fam. **Mimosoideae:** Tropical and semi-tropical forms; corolla regular. Typical genera: *Mimosa*, Mimosa or Sensitive Plant (2829); *Proposis*, Mesquite (2201); *Acacia*, Acacia (4).

Sub-fam. **Caesalpinioidae:** Flower partially "papilionaceous," that is butterfly-shaped. Typical genera: *Gleditsia*, Honey Locust (1627); *Tamarind*, Tamarind (3432); *Circis*, Judas Tree (1901).

Sub-fam. **Papilionoidae:** Flower completely papilionaceous. Typical genera: *Phaseolus*, Bean (347); *Glycine*, Soy Bean (3297); *Pisum*, Pea (2698); *Lothyrus*, Sweet Pea (3405); *Vigua*, Cowpea (910); *Lentilla*, Lentil (1988); *Aracis*, Peanut (2700); *Trifolium*, Clover (809), Shamrock (3195); *Melilotus*, Sweet Clover (809); *Lespedeza*, Japanese Clover (810); *Medicago*, Alfalfa (88); *Astragalus*, Milk Vetch, Loco Weed (3712), Tragacanth (1552); *Glycyrrhiza*, Licorice (1995); *Lotus*, Lotus (2063); *Robinia*, Locust (2045); *Indigofera*, Indigo (1777); *Wisteria*, Wistaria (3773); *Haemotoxylon*, Logwood (2046).

Fam. **Platanaceae:** Typical genus: *Platanus*, Sycamore (3424).

Fam. **Hamamelidaceae:** Typical genus: *Hamamelis*, Witch Hazel (3774).

Fam. **Grossulariaceae:** Typical genus: *Grossularia*, Gooseberry (1488).

Ord. **Geraniales:** Flowers completely cyclic; carpels tend to fuse into "compound pistils" in higher families such as **Melinaceae.**

Fam. **Geraniaceae:** Geranium family. Typical genera: *Pelargonium*, so-called "Geranium" (1435); *Geranium*, true Geranium (1435).

Fam. **Tropaeolaceae**: Typical genus: *Tropaeolum*, Nasturtium (2398).
Fam. **Linaceae**: Typical genera: *Linium*, Flax (1291); *Erythroxylon*, Coca (2742).
Fam. **Meliaceae**: Typical genus: *Swietenia*, Mahogany (2124).
Fam. **Euphorbiaceae**: Spurge family. Typical genera: *Euphorbia*, Spurge (2852); *Ricinus*, Castor Plant (657); *Hevea*, Para Rubber (3073); *Manihot*, Cassava (3434).
Fam. **Oxalidaceae**: Typical genus: *Oxalis*, Oxalis (2607).
Fam. **Rutaceae**: Typical genus: *Citrus*, Orange (2588), Lemon (1985), Lime (2011), Citron (769), Grapefruit (1499).

Ord. **Sapindales**: Flower forms similar to Geraniales; distinguished by structure of ovules.
Fam. **Sapindaceae**: Soap-berry family. Contains over 1,000 species.
Fam. **Hippocastanaceae**: Typical genus: *Aesculus*, Buckeye (523).
Fam. **Celastraceae**: Typical genus: *Celastrus*, American Bittersweet (431).
Fam. **Anacardiaceae**: Typical genera: *Rhus*, Staghorn, Dwarf Sumach (3390); *Toxicodendron*, Poison Sumach, Poison Ivy (3390, 1854, 2852); *Manifera*, Mango (2135).
Fam. **Aceraceae**: Maple family. Typical genus: *Acer*, Maple (2138).
Fam. **Buxaceae**: Typical genus: *Buxus*, Boxwood (1628).
Fam. **Iliaceae**: Typical genus: *Ilex*, Holly (1673).

Ord. **Rhamnales**: Flowers tetra-cyclic, that is the parts of the perianth arise from four distinct circles or whorls. Otherwise order resembles Sapindales.
Fam. **Rhamnaceae**: Buckthorn family. Typical genus: *Rhamnus*, Buckthorn (330).
Fam. **Vitaceae**: Shrubs and climbing vines. Typical genera: *Vitis*, Grapes (1501), Currants (940); *Ampelopsis*, Virginia Creeper (3651, 1854, 2852), Boston Ivy (1854).

Ord. **Malvales**: Most types have carpels fused into compound pistil (syncarpous); flowers cyclic.
Fam. **Malvaceae**: Mallow family (906); stamens fused into tube around pistil. Typical genera: *Malva*, Mallow; *Gossipium*, Cotton (906); *Althaea*, Hollyhock (1673).
Fam. **Tiliaceae**: Linden family; carpels fused; stamen form indefinite. Typical genera: *Tilia*, Linden (2018); *Corchorus*, Jute (1905).
Fam. **Bombacaceae**: Silk cottons; seeds covered with silky hairs. Typical genus: *Adansonia*, Baobab (3532).
Fam. **Sterculiaceae**: Cola nut family; flowers frequently have stamens fused. Typical genus: *Theobroma*, Cacao (562).

Ord. **Parietales**: Complex group with several lines of development; flowers usually have fused carpels; order shows marked relation to Ranales.
Fam. **Passifloraceae**: Typical genus: *Passiflora*, Passion Flower (2691).
Fam. **Begoniaceae**: Typical genus: *Begonia*, Begonia (371).
Fam. **Theaceae** or **Ternstroemiaceae**: The Tea family. Typical genera: *Thea*, Tea (3451); *Camellia*, Camellia (591).
Fam. **Violaceae**: Violet family. Typical genus: *Viola*, Violet (3644), Pansy (2664).

Ord. **Opuntiales**: The Cactus order. Contains one family, **Cactaceae**; flowers have compound pistil. Typical genera: *Cercus*, *Opuntia*, *Echinocactus* (563).

Ord. **Myrtales**: Flowers always cyclic; some perigynous, some epigynous.
Fam. **Myrtaceae**: Myrtle family. Typical genera: *Myrtus*, Myrtle (2385); *Eucalyptus*, Eucalyptus (1186); *Eugenia*, Allspice (2724); *Caryophyllus*, Clove (810).
Fam. **Onagraceae**: Typical genus: *Fuchsia*, Fuchsia (1381).
Fam. **Punicaceae**: Typical genus: *Punica*, Pomegranate (2874).
Fam. **Rhizophoraceae**: Typical genus: *Rhizophora*, Mangrove (2135).

Ord. **Umbellales**: Most highly developed forms in the sub-class Archichlamydeae. Flowers always cyclic and epigynous.
Fam. **Araliaceae**: Typical genera: *Aralia*, False "Sarsaparilla" (3127); *Panax*, Ginseng (1460); *Hedera*, true Ivy (1854).
Fam. **Cornaceae**: Typical genus: *Cornus*, Dogwood (1025).
Fam. **Apiaceae**: The Parsley family; flowers in umbrella-shaped clusters. Typical genera: *Apium*, Celery (671); *Pastinea*, Parsnip (2691); *Daucus*, Carrot (650); *Cicuta*, Water Hemlock (2854); *Conium*, Poison Hemlock (2854).

**Note**: This point marks the end of the sub-class **Archichlamydeae** and the beginning of the sub-class **Sympetalae**, in which the petals are fused into tubular corolla.

Ord. **Ericales**: Most primitive of Sympetalae.
Fam. **Ericaceae**: Heath family. Typical genera: *Gaultheria*, Wintergreen (3752); *Calluna*, Heather (1621); *Vaccinium*, Cranberry (915), Blueberry (439); *Azalea*, Azalea (288); *Kalmia*, Mountain Laurel (1970); *Epigaea*, Trailing Arbutus (173); *Rhododendron*, Rhododendron (3012).

Ord. **Primulales**: Single cycle of stamens, opposite petals; seed-supporting structure "free" inside ovary.
Fam. **Primulaceae**: Primrose family. Typical genera: *Primula*, Primrose (2915), Cowslip (911); *Samolus*, Water Pimpernel or Brookweed; *Lysimachia*, Loosestrife or Moneywort; *Dodecatheon*, Shooting Star or American Cowslip.

Ord. **Ebenales:** Members show both primitive polypetalous forms and advanced epigynous characteristics.
- Fam. **Ebenaceae:** Ebony family. Typical genus: *Diospyros*, Ebony (1073), Persimmon (2740).
- Fam. **Sapotaceae:** Sapodilla family. Typical genera: *Chrysophyllum*, Star Apple (1378); *Sapota*, Sapodilla (1378, 719); *Gutta*, Gutta-Percha Tree (1554).

Ord. **Gentianales:** Flowers stable in type, usually with five sepals and stamens, and two carpels; corolla twisted in bud.
- Fam. **Gentianaceae:** Gentian family. Typical genus: *Gentiana*, Gentian (1412).
- Fam. **Oleaceae:** Olive family; leaves often leathery; many types grow flowers in clusters. Typical genera: *Olea*, Olive (2579); *Ligustrum*, California Privet (1627); *Syringa*, Lilac (2008); *Jasminum*, Jasmine (1876).
- Fam. **Loganiaceae:** Typical genera: *Strychnos*, Nux Vomica (3372); *Gelsemium*, Yellow or Carolina Jasmine (1876).
- Fam. **Apocynaceae:** Dogbane or Periwinkle family. Highly evolved, except that carpels are distinct. Typical genera: *Apocynum*, Dogbane; *Nerium*, Oleander (2577); *Landolphia*, African Rubber (3073); *Vinca*, Trailing Myrtle, Periwinkle (2385).

Ord. **Polemoniales:** Flowers symmetrical with several planes of symmetry.
- Fam. **Polemoniaceae:** Typical genus: *Phlox*, Phlox (2773).
- Fam. **Convolvulaceae:** Twining, climbing plants. Typical genus: *Ipomaea*, Morning Glory (2327), Sweet Potato (3405, 2902).

Ord. **Boraginales:** Types show tendency to evolve lobed ovary, resulting in four-part form.
- Fam. **Boraginaceae:** Borage family; members usually have hairy stems. Typical genera: *Myosotis*, Forget-me-not (1331); *Heliotropium*, Heliotropes (1629).

Ord. **Labiatales:** Flower forms tend to develop about only one axis of symmetry.
- Fam. **Verbenaceae:** The more primitive forms. Typical genera: *Verbena*, Verbena; *Tectona*, Teak (3451).
- Fam. **Menthaceae** or **Labiatae:** Typical genera: *Mentha*, Mint (2257); *Glecoma*, Ground-Ivy (1854); *Nepeta*, Catnip (2258).

Ord. **Personales:** Flowers highly zygomorphic (developed about one axis of symmetry).
- Fam. **Solanaceae:** Night shade family; members frequently poisonous. Typical genera: *Solanum*, Night Shade (2509), White Potato (2900), Egg Plant (2901), European Bittersweet (431); *Nicotiana*, Tobacco (3508, 2901); *Capsicum*, Cayenne Pepper (2901); *Atropa*, Belladonna (2509); *Mandragora*, true Mandrake (2135); *Petunia*, Petunia (2758); *Lycopersicon*, Tomato (3512, 2901).
- Fam. **Bignoniaceae:** Trees and woody climbers; flowers often irregular. Typical genera: *Tecoma*, Trumpet Creeper (3545); *Catalpa*, Catalpa (660).
- Fam. **Scrophulariaceae:** Figwort family; fruit two-celled; many-seeded capsule. Contains more than 2,000 species. Typical genus: *Digitalis*, Foxglove.

Ord. **Rubiales:** Anthers usually distinct, setting order off from Campanulales; flowers epigynous.
- Fam. **Rubiaceae:** Madder family; opposite or whorled leaves with interposed stipules. Typical genera: *Cinchona*, Quinine (2950); *Coffea*, Coffee (820); *Gardenia*, Gardenia.
- Fam. **Caprifoliaceae:** Honeysuckle family; flat-topped flower clusters. Typical genera: *Sambucus*, Elder (1107); *Lonicera*, Honeysuckle (1678).
- Fam. **Dipsaceae:** Typical genus: *Dipsacus*, Teazel (3489).

Ord. **Campanulales:** Contains highest forms of Angiosperms. Anthers often converge or fuse; more than 14,500 species included in order.
- Fam. **Campanulaceae:** Primitive stock of this last great order. Typical genus: *Campanula*, Bluebell (439).
- Fam. **Cucurbitaceae:** The Gourd and Melon family. Typical genera: *Cucurbita*, Squash, Pumpkin (3333); *Cucumis*, Muskmelon, Cantelope (2195), Cucumber (939); *Citrullus*, Watermelon (2196); *Lagenaria*, Gourds (1492).
- Fam. **Compositae:** Many forms here cited often grouped as family **Asteraceae,** the Aster family. The Compositae are the dominant and most highly evolved family of plants, containing over 12,500 species. Characterized by "compound" flowers (1305). Regarded as the highest type known. Typical genera: *Aster*, Aster (236); *Solidago*, Goldenrod (1483); *Chrysanthemum*, Chrysanthemum (762); *Helianthus*, Sunflower (3396); *Taraxacum*, Dandelion (957); *Arnica*, Arnica; *Lactuca*, Lettuce (823); *Cichorium*, Chickory and Endive (823); *Artemisia*, Sage (3103); *Cosmos*, Cosmos (895); *Dahlia*, Dahlia (949); *Helichrysum*, Immortelles (1740); *Carduus*, Thistle (3489); *Gnaphalium*, Cudweed (1740); *Ageratum*, Ageratum; *Rudbeckia*, Black-eyed Susan, Daisy (953); *Bellia*, English Daisy (953); *Calendula*, Marigold (2148). The Compositae are often divided into **Tubuliflorae,** which have a composite floral head made up of small tubular flowers usually surrounded by large "ray" flowers, with conspicuous petals, and **Liguliflorae** whose floral head is composed entirely of ray flowers.

# ZOÖLOGY

## Classification of Animals

THE members of the Animal Kingdom present a far greater variety of structure and function than the members of the Plant Kingdom. This is because the conditions of animal life are far less fixed and stable than those of plant life. Plants obtain their food directly from the air and soil; animals are for the most part compelled to move about in search of food and to adjust themselves to a far greater variety of diet. The struggle between animals for survival is more violent and active than between plants, so that the means of attack and escape are much more highly developed and versatile. Because of the greater variety of forms, animals are even more difficult to classify than plants. Countless differences of opinion exist among authorities, and the systems of classification are subject to change from year to year. The tendency, however, is always to arrive at a classification which will bring out the *natural* relationships between animals from the point of view of evolutionary theories. The method followed here is based upon the best established modern systems. It has been necessary, of course, to omit many of the minor and less important subdivisions. Consult the Botany Outline for the Key to abbreviations.

I. **PROTOZOA:** Primitive single celled forms, of microscopic size (2927). The following scheme is based principally on organs of locomotion.
- Cl. **Rhizopoda:** Thrust out portions of cell as "false feet." (pseudopods). Typical orders: **Lobosa,** pseudopods blunt (genus *Amoeba* 118); **Foraminifera,** coated with lime or cemented sand grains, threadlike pseudopods; **Radiolaria,** radiating spines or needles of silica or chitin-like stiffening.
- Cl. **Mycetozoa:** The Slime Molds (3251). These are often classed as plants, under the name **Myxomycetes.**
- Cl. **Sporozoa:** Parasitic upon animals. Typical order: **Haemosporidia,** blood corpuscle parasites (genus *Plasmodium,* the Malaria Parasite, 2334, 2337).
- Cl. **Mastigophora:** Have "tail" (flagellum); some zoölogists consider them the ancestors of all higher animals.
  - Ord. **Dinoflagellata:** Cellulose-armored, phosphorescent.
  - Ord. **Cystoflagellata:** Gelatinous, phosphorescent forms. Typical genus: *Noctiluca,* on ocean surface
  - Ord. **Flagellata:** One or more flagella at one end.
    - Sub-o. **Phytoflagellata:** Contain chlorophyll. Typical genera: *Volvox,* individuals cluster into visible green globules, which whirl incessantly; *Euglena,* immense numbers give green color to small pools. Group also claimed as plants by botanists, under the name **Volvocales.**
    - Sub-o. **Hemoflagellata:** Blood parasites. Typical genus: *Trypanosoma,* sleeping sickness parasite (3546, 1450 picture).
- Cl. **Ciliata:** Cuticle covered with cilia (vibrating, threadlike organs of locomotion); "dent" in cuticle functions as mouth. Typical genus: *Paramoecium,* common Slipper Animalcule. The Ciliata are sometimes grouped with various other forms in Cl. **Infusoria.**

**Note:** The animals from this point on are known collectively as **Metazoa,** meaning "advanced" forms as distinguished from **Protozoa,** meaning "primitive" forms. While the **Protozoa** are single-celled, the structure of the Metazoa is more complex, consisting usually of groups of cells.

II. **PORIFERA:** The Sponges (3328). Sac-like body of connective tissue with single opening; eat through pores in body wall. Have "skeletons," or stiffening matter, either of earthy or of felt-like material (spongin). Typical classes: **Calcarea,** skeleton of carbonate of lime; **Hexactinellida,** skeleton of silica rods (Venus's Flower Basket, Glass-Rope Sponges); **Demospongiae,** mixed types, skeleton of silica or spongin or both (Cup Sponges, Horny or Bath Sponges, Boring sponges).

III. **COELENTERATA:** Sac-like body; food swept into single orifice or "mouth" by fringe of tentacles; rudimentary sense organs, nerve cells, either scattered throughout body or forming connected system.
- Cl. **Hydrozoa:** Primitive types, tubular or umbrella-shaped (886). Typical orders: **Hydroida,** least developed forms (genus *Hydra* 1707); **Hydrocorallinae,** gather into coral-like colonies with limy skeletons (Millepore Coral); **Siphonophora,** attached to floating bladders or air-sacs (genus *Physalia,* Portuguese Man-of-War 1884).
- Cl. **Scyphozoa:** Body umbrella-shaped; specialized reproductive and sense organs. Typical order: **Discomedusae** (genus *Aurelia,* the common Jelly-Fish 1883).
- Cl. **Anthozoa (Actinozoa):** Individual forms (Sea Anemones 3164), and colonial forms (Corals 884). Have esophagus and primitive muscular tissue in tentacles; colonial types have stiffening matter of carbonate of lime or horny matter.
  - Sub-cl. **(Alcyonaria) Octocoralla:** Eight tentacles. Typical families: **Pennatulidae,** Sea-Pens, with feather shaped upper end (884); **Gorgoniidae,** Sea-Fans (884), Sea-Whips, and Precious Coral of Mediterranean (884, 886).
  - Sub-cl. **Zoantharia:** Forms with variable structure, excluded from **Alcyonaria.** Includes order **Actiniidae,** divisible into sub-orders **Actinaria,** Anemones, and **Madreporaria,** Madrepore Corals (885, picture).
- Cl. **Ctenophora:** Most transparent and delicate of jelly-fish; have adhesive cells instead of "nettles."

**Note:** The term **Vermes** was formerly used to include all the wormlike forms found in the next three groups (IV, V, and VI). But the differences between worm groups have been found to be as great as those between the other great divisions of the animal kingdom, so that most authorities no longer try to retain a single worm group.

IV. **PLATYELMINTHES:** Flatworms; parasitic types. Alimentary canal usually has both mouth and vent; nervous system well developed; rudimentary blood vessels and muscles.
Cl. **Turbellaria,** aquatic, ciliated types; Cl. **Trematoda,** parasitic upon animals (genus *Distomum,* the Liver Fluke 3813); Cl. **Cestoda,** Tapeworms (3813).

V. **ROTIFERA:** Wheel Animalcules (3814). Microscopic; have "wheel" of cilia about free end; resemble both flatworms, primitive ringed-worms, and mollusk forms. (See Note 2, **ARTHROPODA.**)

VI. **COELELMINTHES:** Alimentary canal a separate tube inside tubular body.
Cl. **Chaetognathi:** Bristles about mouth, fins on tail (genus *Saggita,* a sea-worm).
Cl. **Nemathelminthes:** Round-Worms; muscular, sucking esophagus.
Ord. **Nematoda:** Thread-shaped, from microscopic length to 1 yard long. Typical genera: *Anguillula,* Vinegar Eel (3814); *Ascaris,* Round-Worm; *Oxyuris,* Pinworm; *Ankylostoma,* Hookworm (1679); *Trichina,* cause of trichinosis (3814); *Filaria,* possible cause of elephantiasis (3814).
Ord. **Gordiacea:** Hair Worms; typified by Horse-Hair Worm (3814).
Cl. **Annelida:** Cylindrical; body wall segmented or "ringed"; frequently contain red blood.
Sub-cl. **Chaetopoda:** In most forms, each segment has bristles for locomotion. Typical orders: **Polychaeta,** marine types; **Oligochaeta,** fresh-water and soil types (Earthworm, 1066).
Sub-cl. **Hirudinei:** Have suckers instead of bristles; the Leeches (1984).
Cl. **Polyzoa (Bryozoa):** Live in colonies resembling some Hydrozoans; sometimes called "Sea Moss" (3813).
Cl. **Brachiopoda:** Lamp Shells. Have mollusk-like shells (3201, 3813, 3203 picture).

VII. **ECHINODERMA:** Spiny-skinned animals. Star-shaped internal structure, with alimentary canal as axis, usually with arms; skin has limy plates, usually spined; body has water tubes which when filled thrust out arms for locomotion. Heart, blood vessels, muscles, nerves, and sense organs present. Typical classes: **Asteroidea,** five arms, mouth on lower surface (genus *Asterias,* or common Starfish, 3344); **Ophiuroidea,** Brittle-Stars (3345); **Crinoidea,** Sea Lilies, mouth turned upward, arms branched and fringed, lower surface attached to bottom by stalk; **Echinoidea,** Sea Urchins, lack of arms causes globular appearance, alimentary canal coiled inside spherical body wall (Common Urchins and Sand-dollars, 3170, 3345); **Holothuroidea,** Sea Cucumbers (3165), limy plates imbedded, leaving surface leathery, travel with axis horizontal instead of vertical.

VIII. **MOLLUSCA:** Mollusks (2280, 3201); specialized mouth, eyes, gills or primitive lungs, digestive tract, heart and blood vessels, nervous system. Most forms have "mantle" or fold of skin, secreting shell on its outer surface.
Cl. **Amphineura:** Primitive types. Divided into shelled type, with eight plates, enabling animal to roll into ball (Chitons 2281, 3203 picture); and wormlike forms without shells; double or "ladder-like" nerve system.
Cl. **Pelecypoda (Lamellibranchiata):** The Bivalves (2280); mantle divided along back, have hinged shells.
Ord. **Filibranchia:** Gill juncture non-vascular, ciliated. Typical families: **Mytilidae,** short siphons, Mussels (783); **Pectinidae,** free-swimming, eyes on edge of mantle, Scallops (3133).
Ord. **Eulamellibranchia:** Gill juncture vascular. Typical families: **Ostreidae,** Oysters (2612, 2703); **Veneridae,** Quahaug Clam (783); **Myidae,** large siphons not retractable, Soft-Shelled Clam (782); **Teredinidae,** boring types, Teredo or Shipworm (3201); **Unionidae,** Freshwater Mussels (783).
Cl. **Scaphopoda:** Tooth-Shells (3202); mantle secretes tusk shaped shell.
Cl. **Gasteropoda:** Snail-like types (2280); conical or spiral shell; foot usually a creeping sole; primitive eyes; gills in water types, lungs in land types; heart, nerves and muscles.
Ord. **Prosobranchia:** Gills. Typical families: **Patellidae,** Limpets, ring-like gills; **Haliotidae,** Abalones, two comb-like gills (3203 picture); **Muricidae,** secrete purplish dye (genus *Murex* 3201); **Buccinidae,** Whelks, prey upon oysters (3256); **Cypraeidae,** Cowries, carnivorous, narrow opening in shell (3203 picture); **Ampullaridae,** Ampulla or "Watering Pot" Shell (3203 picture); **Littorinidae,** Periwinkles, top-shaped shells (2281, 3256); **Tritoniidae,** Tritons, turret-like, siphonated shells (3203, picture); **Strombidae,** foot narrow, soleless, extremely predaceous, Conches (3202), Wing Shells.
Ord. **Pulmonata:** Lungs, consisting of cavity with network of blood vessels. Typical families: **Helicidae,** True Snails (3255); **Limacidae,** Slugs, shell reduced (3255); **Limnaeidae,** Pond Snails.
Cl. **Cephalopoda:** Foot bent under and joined to head; tentacles surrounding mouth; shell rudimentary ("cuttlebone") or absent. Bodily structure highly organized; well-developed eyes (941, 2280).
Ord. **Tetrabranchia:** Organs grouped in fours; genus *Nautilus* only living type (2418); superfamily **Ammonitoidea,** Ammonites, common among fossils.
Ord. **Dibranchia:** Organs grouped in twos.
Sub-o. **Decapoda:** Ten tentacles. Typical families: **Myopsidae,** common Squid and Cuttlefish (941, 3333); **Oigopsidae,** Giant Squid (942, 3333).
Sub-o. **Octopoda:** Eight-armed. Typical families: **Octopodidae,** Octopus (943, 2559); **Argonautidae,** Argonauts, female has boat-like egg case (2280).

IX. **ARTHROPODA.** Resemble Annelid Worms in segmentation of body, but appendages are jointed to segments; heavily armored with chitin; nervous structure resembles spinal cord; organs highly developed. The Arthropods are divided into five great classes: **(1) Crustacea,** Lobsters, Crabs, Shrimps, and Barnacles; **(2) Arachnida,** Scorpions, Spiders, and Mites; **(3) Diplopoda,** Millipedes; **(4) Chilopoda,** Centipedes; **(5) Hexapoda,** Insects.

**Note 1.** The **Trilobites** (1336) and the **Xiphosura** or King Crabs (913 picture) are considered by some zoölogists as relatives of the Crustacea and by others as relatives of the Arachnida.

**Note 2.** Many authorities are offering the theory that the Annelid Worms and the Arthropoda have both evolved from the stock of the Rotifera. Under this view, these three groups would be placed together under a new great division or phylum, called **Appendiculata,** meaning animals with "appendages" or legs.

**Note 3.** Because of the vast size and many subdivisions of the phylum Arthropoda,the form of the Outline has been varied in the interests of simplicity. The class names appear in the middle of the pages, while the sub-class names begin at the left-hand margin.

Class **CRUSTACEA,** Crustaceans.

Chitinous shell strengthened with lime; gills (modified for air-breathing in land types); appendages develop several branches in swimming types; have horny carapace or "shell" over combined head and thorax (**cephalothorax**).

Sub-cl. **Entomostraca:** Segmentation variable; aquatic, primitive forms. Typical orders: **Branchiopoda,** Brine Shrimps; **Cladocera,** including Water-Fleas.

Sub-cl. **Cirripedia:** Degenerate, parasitic types. Barnacles (331); Sacculina (2678).

Sub-cl. **Malacostraca:** Have 20 or 21 body segments; most types have eyes on stalks.

Ord. **Schizopoda:** Opossum Shrimps found on American coasts and in Great Lakes.

Ord. **Stomatopoda:** Mantis Shrimps; have knife-like grasping claws.

Ord. **Decapoda** ("ten-footed"): Five segments of thorax have walking legs; have strong pincer-like grasping claws (chelae).

Sub-o. **Macrura:** Abdomen large and long. Typical families: **Homaridae,** Lobsters (2041); **Crangonidae,** Shrimps (3225); **Palaemonidae,** Prawns (3225); **Astacidae,** Crawfish (915); **Paguridae,** Hermit Crabs (912, 914, 913 picture).

Sub-o. **Brachyura:** True Crabs (912); abdomen short or rudimentary. Typical families **Cyclometopa,** Common Crabs (912 picture); **Oxyrhyncha,** including Spider Crabs (913 picture); **Catometopa,** including Fiddler Crabs, Pea Crabs (912), and Land Crabs (914 picture).

Class **ARACHNIDA,** Scorpions, Spiders, Mites.

Cephalothorax (fused head and thorax) bears six pairs of appendages, the first two used for grasping, last four pairs as legs. Mouth usually suited for sucking juices. Land forms have either lungs, or **tracheae** (tubes passing air through the body), or both.

Sub-cl. **Arthrogastra:** Abdomen jointed. Typical orders: **Scorpionidea,** Scorpions (3145); **Phrynoidea** or **Pedipalpi,** Whip Scorpions; **Solpugida,** Wind Scorpions; **Phalangida,** Harvestmen, or "Daddy-Long-Legs"; **Pseudoscorpionida,** Book Scorpions.

Sub-cl. **Sphaerogastra:** Abdomen non-segmented and round.

Ord. **Araneida:** Spiders (3320); abdomen set off from cephalothorax by deep constriction (resulting in stalk or "pedicle"); have silk glands (spinnerets). Typical families: **Theraphosidae** or **Mygalidae,** including Bird Spiders (3325 picture), American Tarantulas (3436), and Trap-Door Spiders (3324 picture); **Lycosidae,** Wolf Spiders (3324 picture); **Attidae,** Leaping Spiders; **Argiopidae** or **Epeiridae,** including common Garden Spiders (3320); **Agelenidae,** Labyrinth Spiders (3322).

Ord. **Acarina:** Mites. Abdomen fused with cephalothorax; mouth formed into sucking beak. Includes Red Mites, Water Mites, Ticks, "Itch" Parasites, Cheese Mites, Follicle Mites.

**Note:** The Centipedes and Millipedes or "Thousand-Legs" were formerly included in one class called **Myriapoda.** Centipedes, however, have been found to resemble Insects much more closely than they resemble Millipedes. For this reason the old Myriapoda class has been broken up into **Diplopoda** and **Chilopoda.**

Class **DIPLOPODA,** Millipedes.

Body cylindrical, divided into numerous segments; each two segments covered by single plate, making it appear that two pairs of legs spring from each segment (hence "Diplopoda," meaning double-footed); internal anatomy differs markedly from that of Centipedes.

Class **CHILOPODA,** Centipedes.

Centipedes (679) resemble insects except for numerous segments of body and many legs.

Class **HEXAPODA,** Insects.

The Hexapoda or Insects (1781) are distinguished from other Arthropoda by having 3 pairs of legs. Head, body, and abdomen are separate; breathe by tracheae (air tubes). The manner in which the young develop (1785-6, 1964, 2936) leads to a division of Insects into three sub-classes: **(1) Apterygota; (2) Exopterygota; (3) Endopterygota.**

Sub-cl. **Apterygota:** New-born young closely resemble parents. Typical order: **Thysanura,** primitive, wingless forms, including Bristle Tails and Spring Tails.

Sub-cl. **Exopterygota:** Young of most orders resemble parents; some orders show partial metamorphosis.

Ord. **Ephemerida** or **Ephemeroptera:** Consists of a single family **Ephemeridae,** May-Flies (2178).

Ord. **Odonata:** Dragon Flies and Damsel Flies (1028); strong biting jaws; larvae aquatic.

Ord. **Plectoptera:** Stone Flies; larvae aquatic, with gills.

Ord. **Isoptera:** Social habits similar to ants, but bodily structure differs. Includes White Ants or Termites (143, 1788).

Ord. **Corrodentia:** Winged; single family **Psocidae,** Book Lice.

Ord. **Mallophaga:** Bird Lice; wingless; biting mouths.

Ord. **Euplexoptera:** Front wings hardened into covers; tip of abdomen bears pincers. Typical family: **Forficulidae,** Earwigs (1784).

Ord. **Orthoptera:** Straight-winged, the front pair stiffened into covers; mouth adapted for biting and chewing. Includes three sub-orders **(1) Cursoria** or "Runners" such as Cockroaches (817); **(2) Gressoria** or "Walkers" such as Mantis (2137), Stick Insects and Leaf Insects (1785 pictures); **(3) Saltatoria** or "Jumpers" such as Grasshoppers and Locusts (1503), Katydids (1913), and Crickets (921).

Ord. **Physopoda** or **Thysanoptera:** Thrips; small forms; sucking mouth.

Ord. **Hemiptera:** True Bugs; mouth parts developed for piercing and sucking. Divided into three sub-orders: **(1) Heteroptera,** such as Water Bugs (3696), Bed Bugs, and Chinch Bugs (752); **(2) Homop-**

tera, such as Cicadas (764), Aphids (154), Scale Insects (3132), and Cochineal (817); and **(3) Anoplura,** such as Body Lice (2679 picture).

Sub-cl. **Endopterygota:** Young undergo complete larva-pupa metamorphosis.

Ord. **Neuroptera:** Membranous, net-veined wings; usually carnivorous upon other insects. Includes Ant-Lions (152) and Lacewing Flies (1789).

Ord. **Mecoptera:** Single family **Panorpidae,** Scorpion Flies.

Ord. **Trichoptera:** Larvae aquatic, with gills; build shelters of sticks or stones. Includes Caddis Flies (1786 picture).

Ord. **Lepidoptera:** Butterflies and Moths (544); scales on wings; larvae usually called "Caterpillars" (660). Typical families: **Tortricidae,** including Codlin Moths (820); **Geometridae,** Cankerworms (630); **Bombycidae,** including Silk Worms (3240); **Noctuidae,** including Army-Worms (218) and Cutworms (944); **Pieridae,** including Cabbage Butterfly and Clouded Yellow Butterfly; **Papilionidae,** including Swallow Tails; **Nymphalidae,** the dominant butterfly family, including Admirals, Emperors, Tortoise Shells, etc.

Ord. **Diptera:** True Flies (1313); two-winged, except when wings have degenerated; sucking mouth. Divided into four sub-orders: **(1) Nemocera,** body and proboscis long, including Mosquitoes (2334), and Hessian Flies (1645); **(2) Tanystoma,** body short and proboscis long, including Black Flies and Horse-Flies (1313); **(3) Brachycera,** body short and thick, including House Flies (1312), Blow Flies, Robber Flies, Flesh Flies, and Bot Flies (1313), Tsetse Flies (3546), Hover-Flies (1791 picture); and **(4) Pupipara,** parasites, often wingless, includes Sheep Tick, Bee Louse (1313, 2679 picture).

Ord. **Siphonaptera:** Fleas (1292); wingless; sucking tubes.

Ord. **Coleoptera:** Beetles (366), sheath-winged, like Orthoptera; biting mouths; includes over 100,000 known species. The chief beetle families are listed on page 371. See also Weevils (3713), June Bug (1902), Potato Bug (2902), Lady-Bug (1955), and Fireflies and Glowworms (1262).

Ord. **Hymenoptera:** Four membranous wings; higher forms have elaborately developed instincts; tip of abdomen often equipped with sting. Divided into two sub-orders:

Sub-o. **Symphyla:** Sawflies, primitive types with no waist constriction.

Sub-o. **Apocrita:** With constricted waists and other higher features. The Apocrita are divided into seven super-families:

1. **Cynipoidea:** Gall Flies. Most members lay eggs in plant tissue, producing swelling or "gall" (2548).
2. **Chalcidoidea:** Usually have bright metallic colors; includes Fig Wasps (1237).
3. **Ichneumonoidea:** Ichneumon Flies (1724); long, curved ovipositors, for laying eggs in larvae of other insects.
4. **Vespoidea:** Wasps (3690). Typical Families: **Vespidae,** social types, including Hornets and Yellow Jackets; **Eumenidae,** solitary types, including Potter Wasps; **Pompilidae,** solitary Spider Wasps; **Masaridae,** solitary types usually dwelling in mud banks.
5. **Sphecoidea:** Mud-Dauber Wasps; solitary types, including Fly-Hunters (3692) and "Tool-Using" Wasps (3692).
6. **Apoidea:** Bees (359); honey feeders. Typical families: **Apidae,** Hive Bees (359, 364), tongue short, social life highly organized; **Bombidae,** Bumble Bees (362, 364), tongue long, make "honey-pots" instead of combs; **Megachilidae,** solitary types such as Mason, Leaf-Cutter, and Potter Bees; **Ceratinidae,** small solitary Carpenter Bees; **Xylocopidae,** large Carpenter Bees; **Andrenidae,** Burrowing Bees.
7. **Formicoidea:** Ants (139); females differentiated into queens and workers; social life highly organized. The social ants are grouped into a single great family, **Formicidae.** Certain so-called "Solitary Ants," **Mutillidae,** are sometimes ranked with the superfamily Formicoidea.

**X. CHORDATA:** Body-wall cylindrical, usually with appendages (fins, wings, limbs, etc.). Body stiffened in primitive forms by gristly rod called a *notochord,* lying along spinal cord (130); in higher forms notochord develops vertebrae, many of them supporting ribs.

Sub-ph. **LEPTOCARDII:** Body pointed at both ends; lacks all appendages except tail fin; internal structure extremely primitive; animals lie buried in sand. Typical of this group is the genus *Amphioxus,* Lancelets (1271, 128 diagram).

Sub-ph. **TUNICATA:** Sea-Squirts; usually have mollusk-like mantle or tunic containing cellulose; rudimentary heart.

Sub-ph. **ENTEROPNEUSTA:** Worm-like body; short spinal column, connected by nerve-collar to another system along abdomen. Typical genus, *Balanoglossus.*

Sub-ph. **VERTEBRATA:** The Vertebrates (3634). Notochord found in embryo of all Vertebrates, and remains in the modified form of cartilage skeleton among the lower fishes; higher types develop true bony skeletons. The Vertebrates are divided into five classes: **Pisces,** Fishes; **Amphibia** or **Batrachia,** Amphibians; **Reptilia,** Reptiles; **Aves,** Birds; **Mammalia,** Mammals.

**Note:** The sub-phylum **Vertebrata** includes all the remaining members of the Animal Kingdom. Scientists believe that the first Vertebrates were primitive Fishes; that certain of these Fishes gave rise to the Amphibians; that certain of the Amphibians gave rise to the primitive Reptiles; and that from these in turn were evolved the modern Reptiles, Birds, and Mammals. The same arrangement will be followed as in the case of the Arthropods, the Class names occupying the middle of the page and the Sub-Class names beginning at the left-hand margin.

Class **PISCES,** Fishes.

All Fishes (1271) are water dwellers; breathe with gills; skeleton structure varies from primitive notochord forms to highly organized bony forms.

Sub-cl. **Cyclostomata (Marsipobranchii):** Sucker mouth instead of jaws; primitive skull; spine consists of chord and notochord rod. Includes Lampreys and Hag fishes (1958, 1271, 1272 pieture).

Sub-cl. **Elasmobranchii:** Snout overhangs mouth; true jaws; skeleton cartilaginous; skin smooth with limy dots. Typical orders: **Selachii,** Sharks (3196); **Batoidei,** including Skates and Rays (3244, 1272 pieture), Torpedo-Fish (3517), Sawfish (3131).

Sub-cl. **Teleostomi:** Fishes with well-developed jaws and skulls; body skeleton varies from partly cartilaginous to well-developed bony type.

Ord. **Crossopterygii:** Fins have bony axis, fringed with spines or rays. Numerous fossil types; two living African genera. The **Crossopterygii** or "Fringe-Finned Ganoids," as they are sometimes called are important beeause they are believed to have been the ancestral stock of all the higher Vertebrates.

Ord. **Dipneusti (Dipnoi):** Lung-fishes (2363); gristly skeleton; swim bladder has unusually rich lining of blood-vessels and serves as primitive lung when fish are out of water. Numerous in Paleozoic times; few living types.

Ord. **Ganoidei:** The Ganoids (1272, 1277, 3374). Skeletons vary between primitive (cartilaginous) and advaneed (bony) types; skin covered with bony plates, almost scale-like in some types. Typical sub-orders: **Chondrostei,** including Sturgeons (3374); **Holostei,** including Garpike and Bowfins (2365).

Ord. **Teleostei:** The Bony Fishes; well-developed skeletons; skin usually has well-developed scales. Divided into the following typical sub-orders.

1. **Malacopterygii:** Fin-rays soft. Includes Herring (1645), Shad (3188), Sardines (3126), Tarpon (3438), Salmon (3113), Trout (3545), Whitefish (3733, 1286), Ciseo or Lake Herring (3733).
2. **Ostariophysi:** Swim bladder sensitive to external pressure through ehain of small bones ealled "Weberian ossicles." Includes Electric Eel (3517), Carp (1278), Chubs, Suckers, and Buffalo Fish (1283), Goldfish (1483), Catfish (662).
3. **Apodes:** Eel-like forms. Includes Common Eels (1089), Pelican Fish (1273 picture).
4. **Haplomi:** Differ from Malacopterygii in details of skeleton. Includes Pike (1278), Pickerel (1278), Muskellonge (1278).
5. **Thoracostei:** Specialized gill structures. Includes Sticklebacks (3357), Sea Horses (3165).
6. **Percesoces:** Swim bladder ductless; lower jaw bones fused into single piece. Includes Flying Fish (1314), Climbing Perch (1277, 1273 picture).
7. **Anacanthini:** Soft-finned, but otherwise resembling spiny-finned fishes. Includes Cod and Haddock (1278).
8. **Acanthopterygii:** Bony spines in fins. Ineludes Mackerel (2102), Tunny, Albaeore and Bonita (3552), Pompano, Redfish, and Tilefish (1279), Angler Fish (1273 picture), Gurnards (1273 picture), Lumpsueker (1275 picture), Perch (2726), Angel or Coral Fishes (1271 picture), Bass (1278), fresh-water Sunfish (3396), Swordfish (3423), Flatfish (1289, 1301).
9. **Plectognathi:** Highly specialized forms, with jaw bones fused into single pieces. Includes marine Sunfishes (3396).

**Class AMPHIBIA** or **BATRACHIA,** Amphibians.

The Amphibians mark an intermediate stage between Fishes and Reptiles. As their name indicates (*amphi*, on both sides, *bios*, life), they are fitted for life in water and on land. The typical Amphibians undergo metamorphosis, that is they hatch from the eggs as gill-breathing *larvae* (tadpoles, for example), whieh then develop into lung-breathing adults. There are, however, exceptions to this rule. The fins of the Fishes are in the Amphibians replaced by legs; the skin is soft and glandular; heart is three-chambered. In former geologic periods, Amphibians were abundant, but today there are comparatively few speeies, mostly divided into the following two orders.

Ord. **Caudata** or **Urodela:** Tailed forms; types able to regenerate lost parts. Includes Salamanders and Newts (3112).

Ord. **Ecaudata** or **Anura:** Tailless forms. Typical sub-orders: **Aglossa,** tongue degenerate, such as Pipa Toad; **Phaneroglossa,** tongue developed, including True Toads (3506) and Frogs (1373).

Class **REPTILIA,** Reptiles.

The Reptiles (2997) have no larval stage; skeleton speeialized for land life; four-chambered heart; aquatic forms breathe at surface; skin covered with scales or bony plates. The most primitive Reptile stock is supposed to have evolved two great branehes. The first, springing from Theromorphodont stock (see sub-elass Theromorpha below) gave rise to the first Mammals and various specialized Reptiles, of whieh the Turtles are highest. The seeond branch eame from stock of which the Tuatura or Sphenodon is a living example, and gave rise to the first Birds and speeialized Reptiles, of whieh the Crocodiles, Snakes, and Lizards are the living forms. These two great groups are marked "Evolutionary Group A" and "Evolutionary Group B."

**Evolutionary Group A.**

Sub-el. **Theromorpha:** Varied extinct forms, with many skeletal details and teeth transitional between Amphibia and Mammals.

Sub-cl. **Plesiosauria:** Plesiosaurs (2997). Extinct forms; long necks, paddle limbs; eomparatively slow-moving, aquatic types.

Sub-el. **Ichthyosauria:** Ichthyosaurs (2997). Extinct forms; short neeks, toothed beaks; swift-moving, whale-like forms, exclusively aquatic; bore living young.

Sub-cl. **Chelonia:**

Ord. **Chelonia:** Turtles (3562). Toothless, horny beak; body protected by bony case; limbs developed for walking or swimming. Divided into two sub-orders: **(1) Athecae,** shell leathery, including Leatherbacks (3562); **(2) Thecophora,** shell hard, including Land Tortoises (3520), and all the remaining Turtles (3562-3).

**Evolutionary Group B.**

Sub-cl. **Prosauria:** Typical sub-order is Rhynchocephalia, of which the Tuatara or Sphenodon (2038) is the only living representative. First birds may have developed from Prosaurian stock.

Sub-cl. **Pterosauria:** Extinct flying reptiles, in outward appearance like bats. Typical order: **Pterodactyli,** the Pterodactyls (134, 136).

Sub-cl. **Dinosauria:** Extinct; represented by many Mesozoic monsters (132). Some had many bird-like features (hollow bones, anatomy of hind leg, etc.), but birds already existed when these forms flourished.

Sub-cl. **Crocodilia:**

Ord. **Crocodilia:** Differ from other reptiles chiefly in skull structure. Order includes Crocodiles (922), and Alligators (98).

Sub-cl. **Sauria:** Lizards and Snakes. Differ from other reptiles chiefly in structure of skeleton.

Ord. **Ophidia:** Snakes (3257). Lack limbs; halves of lower jaw connected by elastic tissue. See also articles on Boa Constrictor (440), Pythons (2942), Cobra (816), Vipers (3646), Rattlesnake (2978), Moccasin (2274), and Copperhead (884).

Ord. **Lacertilia:** Lizards (2035); limbs usually developed and functional; halves of lower jaw fused solidly together. Divided into three sub-orders: **(1) Lacertae,** most typical Lizards, including Garden Lizards, Iguanas (1729), Horned Toads (2037–8), Gila Monsters (2035, 2037), Swifts (2038), Glass Snakes (2037, 2036 picture); **(2) Geckones,** the Geckos (2037, 2038 picture); **(3) Chameleontes,** the True Chameleons (685).

Class **AVES,** Birds.

The skeleton of Birds (400–426) resembles the reptile type, save in modifications to permit flying; skin produces feathers (1228); four-chambered heart; teeth lacking except in fossil forms. The primitive ancestor of all Birds probably came from reptile stock.

Sub-cl. **Archeornithes:** Extinct forms; possessed teeth. Includes, Archaeopteryx (401 picture).

Sub-cl. **Ratitae:** Running types; lack "keel-shaped" (carinate) breastbone; orders differ in bones of foot (2603).

Ord. **Struthiones:** Two-toed. Includes True Ostriches (2603).

Ord. **Rheae:** Three-toed; feathers have short aftershafts. Includes Rhea (2603).

Ord. **Casuarii:** Three-toed, feather aftershafts as long as main shafts, giving shaggy appearance to plumage. Includes Cassowaries (654), Emus (1145), and extinct Moas (3443 picture).

Ord. **Apteryges:** Four toes, bill long and slender. Includes Apteryx or Kiwi (409 picture of foot).

Sub-cl. **Carinatae:** Contains all types which have "keel-shaped" (carinate) breastbones.

Ord. **Pygopodes:** Diving birds, webbed feet set far back toward tail. Order includes Loons (2062), Grebes (413 picture), Auks (258), Puffins, and Murres.

Ord. **Impennes:** Wings developed into swimming paddles. Includes Penguins (2715).

Ord. **Longipennes:** Long-winged sea-birds. Includes Gulls and Terns (1549, 413 picture).

Ord. **Tubinares:** Sea-birds with tubular nostrils. Includes Petrels (2747), Albatrosses (80).

Ord. **Steganopodes:** Yoke-toed water birds; good fliers. Includes Pelicans (2709), Frigate Birds (1372), Cormorants (413, 751 picture), and Gannets.

Ord. **Anseres:** Bills in most types have fluted "strainers" along edge (1044 picture); front toes webbed. Includes Ducks (1044), Geese (1487), Swans (3399), Mergansers (1046).

Ord. **Odontoglossae:** Intermediate between Anseres and Herodiones; characterized by box-like beak. Flamingoes (1289, 414 picture).

Ord. **Herodiones:** Long-legged wading birds; divided according to beaks into three sub-orders: **(1) Herodii,** bill straight, sharp-pointed, including Herons (3364, 414 picture), Bitterns (431), and Egrets (3365); **(2) Ibides,** bill grooved on each side, including Ibis (3364), Spoonbills (3364); **(3) Ciconiae,** bill thick at base, curved at tip including Common Stork and American Wood Ibis (3362, 3365).

Ord. **Paludicolae:** Marsh dwellers; hind toe higher on leg than others; fly with neck extended. Includes Cranes (3365, 915), Rails and Coots (2961).

Ord. **Limicolae:** Shore Birds; long, thin legs; feet usually unwebbed; wings V-shaped when open; good fliers. Includes Plovers (2838), Killdeers, Avocets, and Stilts (2839), Snipe, Sandpipers, and Curlews (3261), Woodcock (3779).

Ord. **Gallinae:** Fowl-like birds; bill, wings, and legs short, hind toe elevated; body heavy. Includes Quail, Bobwhites, and Partridge (2943), Grouse (1543), Prairie Chickens and Ptarmigans (1545), Turkeys (3556), Pheasants (2759), Peacocks (2699), Domestic Fowl (2908).

Ord. **Columbae:** Bills swelled at base; hind toes level with front toes. Includes Pigeons and Doves (2803).

Ord. **Raptores (Accipitres):** Group is set off by habits rather than physical characteristics; bills strongly hooked. Includes three sub-orders: **(1) Sarcorhamphi,** Buzzards (550), Condors (856), Vultures (3662); **(2) Falcones,** including Hawks and Falcons (1605), Eagles (1053), Kites (1930), Secretary Birds (3171); **(3) Striges,** Owls (2606).

Ord. **Psittaci:** Parrots, Macaws, and Cockatoos (2690, 2094); short hooked bill; two toes point forward and two back.

Ord. **Coccyges:** (417). Includes Cuckoos and Road-Runners (939), Kingfishers (1925), Turacos (411), Hornbills (1681).

Ord. **Pici:** Feet and tail suited for clinging to bark; long barbed tongue. Includes Woodpeckers (3780, 416 picture), Flickers (3780, 416 picture), Sapsuckers (3781, 416 picture), Toucans (3520).

Ord. **Machrochires:** Long-winged land types; feet weak, unsuited for perching. Includes Goatsuckers or Nighthawks (2508), Whippoorwills (3732), Humming Birds (1698, 416 picture), Swifts (3398, 3399, 416 picture).

Ord. **Passeres:** The "perching" birds; feet suited to grasping branches or twigs. This is by far the largest of the bird orders. The leading families of this order, including all the families found in North America, are listed in the table on page 412. See also Flycatchers (1313), Kingbirds (1925), True Larks (1963), Crows (926), Jackdaws and Rooks (2124), Blue Jays (440), Starlings (3345, 417 picture), Orioles (2600, 417 picture), Bobolinks (446, 418 picture), Blackbirds (432, 417 picture), Meadowlarks (2179, 418 picture), Finches (1241), Grosbeaks (1542, 418 picture), Sparrows (3308, 418 pictures), Cardinals (642), Tanagers (3432, 420 picture), Swallows and Martins (3398, 419 picture), Waxwings (3706), Shrikes (3225, 419 picture), Vireos (3647, 419 picture), Warblers (3669, 420 picture), Titlarks, Wagtails, and Pipits (3505, 419 picture), Mocking-birds (2274, 419 picture), Thrashers (3492), Catbirds (660), Wrens (3815, 419 picture), Nuthatches (2544, 420 picture), Creepers (2544, 419 picture), Titmice (3505), Chickadees (728, 420 picture), Nightingales (2508), Kinglets and Gnatcatchers (1926, 420 picture), Thrushes (3494), Robins (3028, 420 picture), Bluebirds (439).

Class **MAMMALIA,** Mammals.

The Mammals (2132) include all vertebrates which have true hair and the young of which are nourished with their mothers' milk. The class is here subdivided into three sub-classes according to the degree of development of the young at the time of birth. It is generally believed by scientists that mammals evolved from reptile stock, although the course of evolution thereafter is uncertain. The earliest known Mammals lived at about the same geologic period as the giant Reptiles and the first Birds.

Sub-cl. **Prototheria:** Primitive types; lay eggs and hatch young; one living order, **Monotremata.** Includes Duckbill (1046) and Spiny Ant-Eaters (266 picture).

Sub-cl. **Metatheria:** Young born alive but not perfectly formed; development completed in a skin-pouch on mother's body. One living order, **Marsupialia,** divided into two sub-orders: **(1) Diprotodonta,** teeth adapted to vegetable food, including Wombats (1908, 266, 397 picture), Phalangers (1908, 266 picture), Kangaroos (1907, 266); **(2) Polyprotodonta,** teeth adapted to animal food, including Opossums (2585), Tasmanian Devil and Tasmanian Wolf (3438, 3439), Bandicoots (266).

Sub-cl. **Eutheria (Placentalia):** Young completely developed when born (1908); often divided into four groups according to presence of claws, hoofs, flippers, or nails on the extremities. The flippered Sirenians (See Ord. Sirenia) are classed, however, with the hoofed group, since their internal structure is that of a hoofed animal. The seals are placed in the clawed group for a similar reason.

Group A. **Unguiculata** (Clawed Animals).

Ord. **Insectivora:** The most primitive of the higher Mammals; teeth suited for eating insects; feet plantigrade (heel-walking); most types nocturnal. Typical sub-orders: **(1) Menotyphla,** pelvis united, including Tree Shrews with bony-ringed eye socket, and Elephant or Jumping Shrews with imperfect eye socket and hind legs elongated; **(2) Lipotyphla,** pelvic union imperfect, including Moles (2278), Shrews (2279), Hedgehogs (1627).

Ord. **Dermoptera:** Flying Lemurs; curious Malayan forms, with affinities to Insectivora, Bats, and Lemurs. Only two species are known.

Ord. **Chiroptera:** Bats (345); fore-limbs winged; internal structure modified for true flight. Typical sub-orders: **(1) Megachiroptera,** teeth adapted to fruit-eating, Flying Foxes (346); **(2) Microchiroptera,** adapted to eating insects or sucking blood, including Vampires (346), and Common Bats (345).

Ord. **Carnivora:** Flesh-Eaters. A mixed group, containing types which sometimes eat vegetable food as well as the true flesh-eaters. Teeth and skeleton structure adapted to seizing and killing prey. Divided into two sub-orders, according to habitat.

Sub-o. **Fissipedia:** Terrestrial types.

Fam. **Canidae:** Dogs (1018); Wolves and Coyotes (3774); Jackals (1855); Foxes (1336). Structure adapted for running down prey; feet digitigrade or "toe-walking."

Fam. **Procyonidae:** Raccoons (2951); usually tree-dwellers; feet plantigrade.

Fam. **Ursidae:** Bears (349); teeth adapted alike to vegetable and flesh diet.

Fam. **Mustelidae:** Weasel family. Body long, slender, active; teeth highly evolved; feet partly digitigrade. Includes Martens and Sables (2155), Stoats or Ermine (1174), Weasels (3707), Polecats (3246), Ferrets (1234), Minks (2251), Gluttons or Wolverines (3776), Skunks (3246), Badgers (303), Otters (2605).

Fam. **Hyaenidae:** Hyenas (1711). Many dog-like characteristics.

Fam. **Viverridae:** Mongooses (2286), Civets (2728), Aardwolves. Types intermediate between hyenas and cats, with more teeth than cats.

Fam. **Felidae:** Cat family. Most highly specialized carnivores; structure suited for leaping upon prey. Includes Cats (657), Jaguars (1859), Leopards or Panthers (1988), Lions (2024), Ocelots (1989), Pumas or Mountain Lions (2933), Tigers (3498), Lynxes (2087), Cheetahs (1989).

Sub-o. **Pinnipedia:** Aquatic forms, limbs partially or wholly developed into flippers. Includes True Seals (3166–7), Walruses (3668), Sea-Bears or Fur-Seals (3166, 3167–8), Sea-Lions and Sea-Elephants (3168).

Ord. **Rodentia:** Rodents (3036); teeth and jaws adapted to gnawing.

Sub-o. **Simplicidentata:** Single pair of incisors in upper jaw; families differ in skull structure and dentition. Includes Squirrels (3333), Chipmunks (752), Prairie Dogs (2912), Marmots (2912, 1543), Groundhogs or Woodchucks (1543), Beavers (356), Pouched Rats or Pocket-Gophers (1488), Kangaroo Rats (2977), Dormice (1027), Jerboas (2977), Hamsters (2977), Voles or Field Mice and Lemmings (2359), Muskrats (2384), True Rats (2977) and Mice (2359), Porcupines (2883), Cavies or Guinea-Pigs (1548), Capybaras (3036), Chinchillas (752).

Sub-o. **Duplicidentata:** Two pairs of incisors in upper jaw, one behind the other. Includes Picas or Mouse Hares (1585), Hares and Rabbits (1583).

Ord. **Edentata:** Toothless or with rudimentary teeth in rear of jaw; exceedingly varied types. Two sub-orders: **(1) Pilosa,** hairy types, including Ant-Eaters (145); **(2) Dasypoda,** armoured types, including Armadilloes (211).

Ord. **Pholidota:** True Scaly Ant-Eaters or Pangolins. Covered with horny, overlapping scales.

Ord. **Tubulidentata:** Aardvarks (145). Tubular snout, large number of lumbar vertebrae.

Group B. **Ungulata** (Hoofed Animals).

Ord. **Artiodactyla:** Hoofed animals, usually even-toed; odd-toed types have digits symmetrical about the vertical mid-plane of the hoof.

Sub-o. **Suina:** Lower leg not fused into cannon bone; upper incisor teeth always present, often tusked. Stomach varies from simple to ruminant type.

Fam. **Suidae:** Pigs (1670); Wild Boars (440). Snout has fleshy button; tusks of male curve upward; stomach simple; four toes on each foot, outside two not touching ground.

Fam. **Tagassuidae:** Peccaries (2706, 1671 picture). Tusks small, point downward; front feet have four toes (two not touching ground) and rear feet only three.

Fam. **Hippopotamidae:** Hippopotamus (1651–3). Muzzle broad, rounded; stomach complex; all four toes touch ground.

Sub-o. **Tylopoda:** Feet have large, cushioned pads; stomach complex but not completely ruminant (3083). Typical family: **Camelidae,** including Camels (588), Alpacas and Vicunas (100), Llamas (2039).

Sub-o. **Pecora:** The true ruminants (3082) or "cud-chewers."

Fam. **Giraffidae:** Giraffes (1463). Adapted to browsing; solid horned.

Fam. **Cervidae:** Deer (979). Antlers solid-horned, shed annually. See also Caribou (644), True Elk or Moose (2325, 1138), Musk Deer (2383), Reindeer (2993), American "Elk" or Wapiti (3669, 1138).

Fam. **Antilocapridae:** American Antelope or Pronghorns (146, 147 picture). Have hollow horns growing from bony cores and shedding annually.

Fam. **Antelopidae:** True Antelopes (146), Chamois (686), Rocky Mountain Goat (146, 147 picture). Permanent hollow horns growing from bony horn-core.

Fam. **Bovidae:** Short cannon bones; permanent hollow horns from bony horn-core. Includes Common Cattle (662), True Buffalo (527), Zebus (3838), Yaks (3827), Goats (1476), Ibex (1719), Bison or American Buffalo (428), Aurochs (431), Musk oxen (2383).

Ord. **Perissodactyla:** Usually odd-toed; where toes are even in number, they are not symmetrical about the vertical mid-plane of the hoof.

Fam. **Equidae:** Foot structure highly evolved (1682), teeth unusually long. Includes Horses (1683), Asses (235), Zebras (3838).

Fam. **Tapiridae:** Tapirs (3434); have proboscis, small tusks and simple teeth; front foot has four toes.

Fam. **Rhinocerotidae:** Rhinoceroses (3006–7).

Ord. **Proboscidea:** Nose and upper lip extended to form trunk. Includes Elephants (1126–32), Mammoths (2132, 667 picture), Mastodons (2132).

Ord. **Sirenia:** Aquatic mammals with flippers; eat vegetable food, in contrast with Cetaceans (see Group C. Cetacea) and the Seals (See Ord. Carnivora); internal structure indicates descent from ancestor of Proboscideans. Includes Manatees (2134), and Dugongs (2134).

Ord. **Hyracoidea:** Curious types, with some features of skull unique among mammals, cheek teeth like those of rhinoceros; in size and habits like hares. Includes Hyraxes or Rock-Rabbits, called "Conies" in the Bible.

Group C. **Cetacea** (Mammals with True Flippers).

Ord. **Odontoceti:** Toothed Whales (3726). Order includes Sperm-Whales (3726), Dolphins (1026–7), Porpoises (2884), Grampuses (3723), and Narwhals (2884, 3723).

Ord. **Mystacoceti:** Whalebone Whales. Order includes Right Whales (3724), Rorquals (3726, 3725 picture), Humpbacks (3725 picture).

Group D. **Primates** (Mammals with Nails).

Ord. **Primates:** Five-fingered hands and five-toed feet, with nails; eyes directed forward.

Sub-o. **Lemuroidea:** Lemurs (1986). Face long and fox-like; long tails, not suited for grasping.

Sub-o. **Anthropoidea:** Face rounded, cranium comparatively high; details of internal organs closer to human type than those of Lemurs. The Anthropoidea are divisible into two sections: **(1) Platyrrhina** or New World types (2289), with nostrils far apart, tail often prehensile, three pairs of premolar teeth in each jaw; **(2) Catarrhina** or Old World types, with nostrils close together, tail never prehensile, two pairs of premolar teeth in each jaw. The first two families are New World types, the remainder belong to the Old World section.

Fam. **Cebidae:** New World Monkeys (2289) with opposable thumbs, more or less naked ears, and flat or curved nails.

Fam. **Hapalidae:** Marmosets (2290, 2289 picture). Hairy ears; thumb not opposable, nails clawlike.

Fam. **Hylobatidae:** Gibbons (2288 picture), long-armed, tailless; thumb short, backbone without S-shaped curve of higher types.

Fam. **Cercopithecidae:** Old World Monkeys (2289) including Baboons (2292). Wedge-shaped chest; arms shorter than legs; tail usually present.

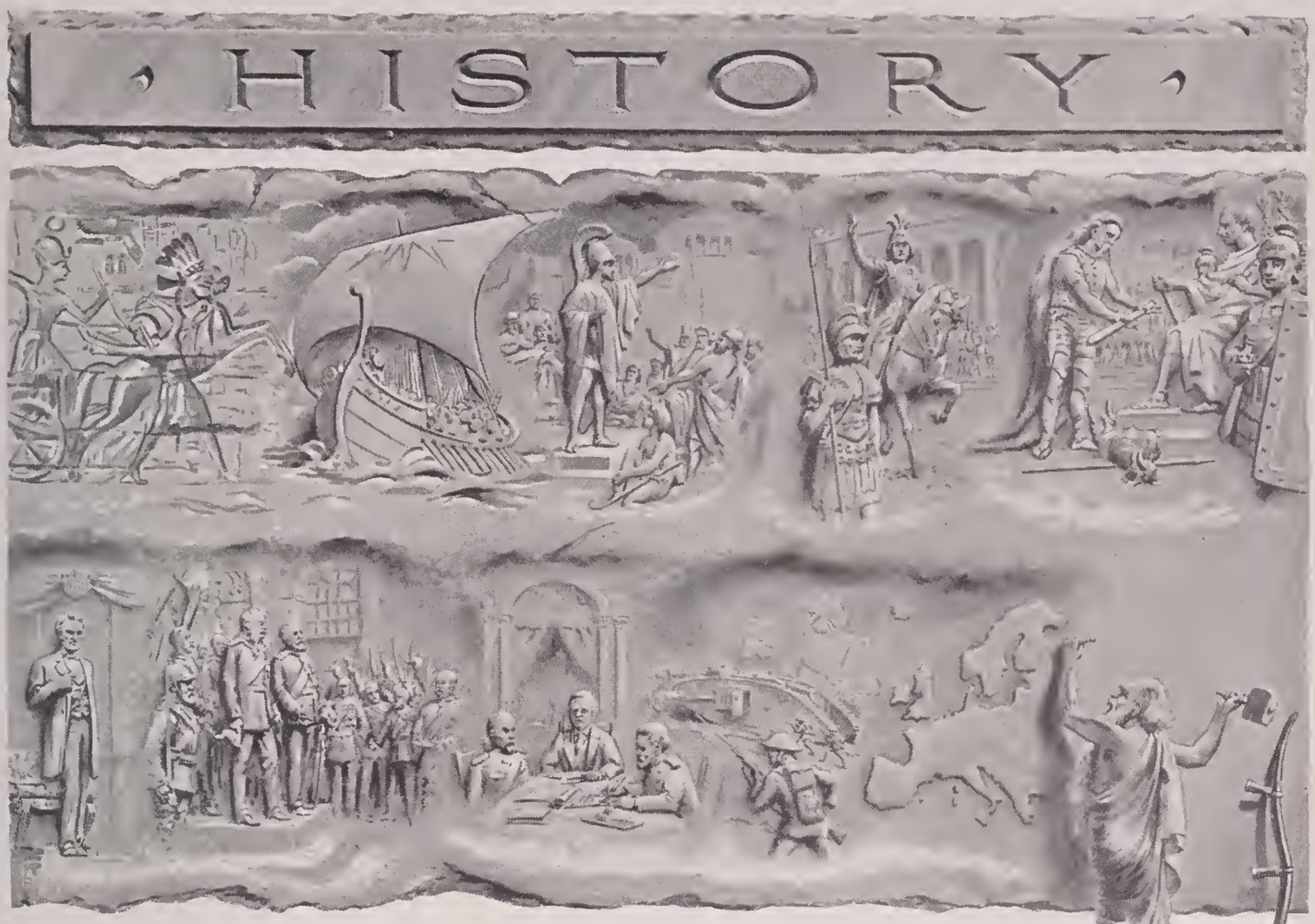
Fam. **Simiidae:** Higher Apes (153). Broad chest; arms longer than legs, but shorter than in Gibbons; S-shaped curve of backbone partially developed; prominent canine teeth; jaws not curved at sides as in man; cerebrum smaller than in man. Includes Orang-utans (2590), Chimpanzees (738), Gorillas (1491).

Fam. **Hominidae:** The human type. Single living genus, with one living species—**Homo sapiens,** or Man (2133).

# Books for the Biology Student

Note: The list of books which accompanies the Outline on Nature Study deals with the habits of plants and animals from the point of view of common experience and observation. The books listed here emphasize rather the fundamental laws of life, the structure and physiology of living creatures, and the history of life and its evolution. They were chosen for their importance, their clearness, and their interest, and while they may present a few technical difficulties to the newcomer in Biology, they will soon prove as fascinating as any story of travel or adventure.

**Biology for Beginners.** Truman J. Moon.
**Elementary Biology.** Benjamin C. Gruenberg.
**Biology: An Introductory Study.** Herbert W. Conn.
**Biology and Its Makers.** W. A. Locy.
**A History of Science.** H. S. and E. H. Williams.
**The Science of Life.** J. Arthur Thomson.
**Applied Biology.** Maurice A. and Mrs. Anna N. Bigelow.
**A Source Book of Biological Nature Study.** Elliot Rowland Downing.
**Dynamics of Living Matter.** Jacques Loeb.
**The Organism as a Whole.** Jacques Loeb.
**The Cell in Development and Inheritance.** Edmund B. Wilson.
**Principles of Nutrition.** W. H. Jordan.
**Elementary Studies in Botany.** J. M. Coulter.
**Practical Botany.** Joseph Y. Bergen and Otis W. Caldwell.
**Laboratory and Field Manual of Botany.** Joseph Y. Bergen and Bradley M. Davis.
**Handbook of Practical Botany.** Eduard Strasburger.
**Botany for High Schools and Colleges.** Charles E. Bessey.
**Nature and Development of Plants.** Carlton C. Curtis.
**Experiments with Plants.** W. J. V. Osterhout.
**Plant Life and Plant Uses.** John Gaylord Coulter.
**Plants and Their Uses.** Frederick L. Sargent.
**Plant Anatomy.** William Chase Stevens.
**An Introduction to Vegetable Physiology.** J. Reynolds Green.
**Lectures on Plant Physiology.** Ludwig Jost.
**Plant Relations.** J. M. Coulter.
**Plant Structures.** J. M. Coulter.
**The Living Plant.** William F. Ganong.
**Natural History of Plants** (4 vols.). Anton Joseph Kerner.
**Plant Geography upon a Physiological Basis.** A. F. W. Schimper.
**Scientific Aspects of Luther Burbank's Work.** Vernon L. Kellogg and David Starr Jordan.
**Plant Breeding.** Hugo de Vries.
**New Creations in Plant Life.** William S. Harwood.
**Fundamentals of Plant Breeding.** J. M. Coulter.
**Fertilization of Flowers.** Hermann Müller.
**Bacteria, Yeasts, and Molds in the Home.** Herbert W. Conn.
**Mosses with a Hand Lens and Microscope.** A. J. Grout.
**The Ferns of North America.** Daniel Cady Eaton.
**Our Native Ferns and How to Study Them.** Lucien M. Underwood.
**Flower Guide.** Chester A. Reed.
**Field Book of American Wild Flowers.** Ferdinand Schuyler Mathews.
**Trees of the Northern United States.** Austin C. Apgar.
**Familiar Trees.** Ferdinand Schuyler Mathews.
**Manual of the Trees of North America.** Charles S. Sargent.
**The Elements of Animal Biology.** Samuel J. Holmes.
**An Introduction to Zoölogy.** Robert W. Hegner.
**Manual of Zoölogy.** Thomas J. Parker and William A. Haswell.
**Zoölogy, Descriptive and Practical.** Buel P. Colton.
**A Textbook of Zoölogy** (2 Vols.). Thomas J. Parker and William A. Haswell.
**Economic Zoölogy.** Herbert Osborn.
**Animals of the Past.** Frederic A. Lucas.
**The Animals and Man.** Vernon L. Kellogg.
**Animal Intelligence.** George J. Romanes.
**Animal Behavior.** C. Lloyd Morgan.
**The Geographical Distribution of Animals.** Alfred Russel Wallace.
**The Insect Book.** L. O. Howard.
**The Spider Book.** J. H. Comstock.
**Genera of Fishes.** David Starr Jordan.
**The Reptile Book.** Raymond L. Ditmars.
**Bird Life.** Frank M. Chapman.
**A Geographical History of Mammals.** Richard Lydekker.
**Mammals Living and Extinct.** W. H. Flower and Richard Lydekker.
**The Age of Mammals.** Henry Fairfield Osborn.
**A History of Land Mammals in the Western Hemisphere.** William Berryman Scott.
**The Origin of Species.** Charles Darwin.
**Mendel's Principles of Heredity.** William Bateson.
**The Mutation Theory.** Hugo de Vries.
**Species and Varieties. Their Origin by Mutation.** Hugo de Vries.
**The Evolution Theory.** August Weismann.
**Man's Place in Nature.** Thomas H. Huxley.
**Darwinism Today.** Vernon L. Kellogg.
**Origin and Evolution of Life.** Henry Fairfield Osborn.
**Evolution and Animal Life.** David Starr Jordan and Vernon L. Kellogg.




HISTORY occupies a more important place in the field of knowledge today than it has ever occupied before. International problems have captured the public interest and have become matters of practical concern the world over. We have come to realize that the traditions, ideals, and political relations of other nations and other peoples, no matter how remote, can often become of vital significance to us. If we are to form sound opinions upon world affairs, we must know the historical background of world politics. This link of the present with the past extends to all human affairs. We shall understand the social and economic questions of our own times far better if we are able to trace their origin and their development down the ages. History, as it is taught and written today, is no longer a narrative of isolated incidents, of wars, of intrigue, of marriages and deaths of kings and queens, or of the detached deeds of famous men and women. It is on the contrary an account of the origin and development of human institutions and ideas. It deals with the conditions under which ordinary men lived in various ages and countries; it deals with their customs, arts, and ideals; with the growth of law and government; and with the influence of leaders upon the fate of peoples. At all times it seeks material on which to base general principles of human conduct, so that we in the present may profit by the mistakes and successes of the past.

# ANCIENT HISTORY

## The Dawn of Civilization

**I. PREHISTORIC PERIOD:** For thousands of years before the oldest kind of writing was invented, men and women and children had been working and playing in many parts of the world. By carefully studying the things they have left us—stone tools, pieces of pottery, and pictures on cave walls—we have learned a great deal about the way these people lived and can trace the almost unbelievably slow steps by which they learned the arts of civilization. Because they lived before there was any *written* history, we call them prehistoric men.

**A. Primitive Man: 2133–4.**

**a. Old Stone Age (Paleolithic Age): 3360–1, 771.**

**1.** Cave Dwellers: 666, 668.

**2.** Remarkable artistic ability shown: 2627; drawings: 2628 (picture).

**b. New Stone Age (Neolithic Age): 3361.**

**1.** Beginnings of settled life and division of labor: 771–2.

**2.** Interesting remains: Lake Dwellers 1957; in Egypt 1098.

B. Dawn of History with Bronze Age:
   a. **Discovery of Metals Quickens March of Progress: 772–3.** Relics found 515 (picture).
   b. **Invention of Writing Ends Prehistoric Age: 773, 1654.**

II. **DEVELOPMENT OF CIVILIZATION ALONG THE NILE: 1098.**

A. **Favorable Situation of Northern Eygpt: 1092.** The fertile strip of the Nile Valley sheltered on all sides by deserts and the sea was an ideal situation for the beginnings in civilization. The rich soil brought down by the Nile supported a dense population; the river itself was a great highway; the quarries of the nearby deserts furnished unlimited building materials.

B. Great Epochs of Egyptian History:
   a. **Long Period of Early Development Culminating in the Union of Upper and Lower Egypt: 1099.**
   b. **Pyramid Age: 1099–1102.** The building of monumental Pyramid tombs to gratify the vanity of the Pharaohs which became the dominant interest, exhausted the wealth, and took a terrific toll of the slave labor: 2939–40, 568–9, 176, 570, and 1094 (picture).
   c. **Feudal Period—when Nobles Ruled Vast Estates: 1102.** During a long struggle between rival rulers and sections Egypt became so weak that it fell before foreign conquerors, the Hyksos or Semitic "Shepherd Kings": 1102.
   d. **Defeat of Shepherd Kings and Rise of the Empire: 1104–6.**
      1. Egyptian nobles revolted against the Hyksos and drove them out (about 1600 B.C.).
      2. Great Temple of Karnak crowned revival of art: picture facing 176.
   e. **Fall of the Empire: 1106.** Pursuing the Shepherd Kings into Asia, the Egyptians began a period of foreign conquest, which for many centuries added to Egypt's glory, but which finally led to the invasion and subjugation of Egypt, first by the Assyrians (670 B.C.) and later by the Persians (525 B.C.). With these invasions ended the period of distinctive Egyptian culture.

   **Note:** The Egyptian rulers are often grouped into dynasties beginning with Menes (3400 B.C.). The IVth Dynasty marked the height of the Pyramid Age; the XVIIIth began, and the XXXIst ended the Imperial Period.

C. How the Ancient Egyptians Lived:
   a. **Their Religion:**
      1. Belief in a life after death shown by careful preservation of bodies (mummies), and building of suitable tombs: 1099, 2369, 1102, and 1104 (pictures).
      2. Important gods: 1832, 2602, 1106.
      3. Sacred animals: 369, 658, 923, 1106, 1410, 2286, 3364.
      4. Priesthood: 1104, 2193.
   b. **Industrial Life: 1100.** Agriculture 48, 3732; Boats and ships 3207, 3524, 3525 (picture); Bread, 496; Brick-making 503; Enameling 1145; Fisheries 1282; Furniture 1383; Harps 1589; Beasts of Burden 1684, 1685, 3524; Ink 1780; Papyrus 2674, 2666; Spinning and Weaving 3326, 904; Water-clock 797; Mining 2251, 1479; Canals and Irrigation 625, 1828.
   c. **Art and Science: 1100, 1102.** Architecture 176, 2939–40, 1104, 178 (picture); Astronomy 239; Books 455; Language and Writing 1098–9, 3816, 3817, 1649, 2666, 2710 (picture), 101 (picture); Beginnings of Mathematics 93, 1422; Painting 2627, 2629 (picture); Sculpture 3155, 3316–7, 1103–6 (pictures), 1206, 3155 (picture).

III. **EARLY CIVILIZATIONS OF WESTERN ASIA:** That part of Asia which we call today the Near East, consisting of Asia Minor, Syria, and the Arabian Peninsula, was the ancient home of civilizations which were of immense importance because of their profound influence upon subsequent culture and history. These civilizations grew up in what has been called the Fertile Crescent, consisting of that borderland between the mountains in the north and the Arabian desert where crops could be grown and cities could be built.

A. **Mesopotamia—the Eastern Part of the Fertile Crescent: 2200–1.**
   a. **Sumerian Culture:** The Sumerians (a non-Semitic people) in their group of city states along the Tigris and Euphrates Rivers originated the characteristic culture of Mesopotamia which was to endure through centuries of conquest (295).
      —Cuneiform Writing 939; oldest known Library 1992; Phalanx 297 (picture).
   b. **Babylonian Empire: 295–7.** Established by Semitic tribes who conquered Sumerian cities. The conquerors absorbed and modified the Sumerian culture, developing a highly organized social and political system.
      —Architecture 176; Brick and Tile 502–3; Street Paving 3023; Education 294; Writing 294, 3817 (picture); Engraved Seals 1410; Origin of Seven-day Week 3713; Invention of Sundial 797.
   c. **Assyria Absorbs Babylonia in Great Assyrian Empire:**
      1. Improvements in art of warfare make possible the conquest of a vast military empire 297–8; introduction of iron weapons increases fighting efficiency 1817.
      2. Conquest of Hittites and Israelite Tribes: 1669, 1890.
      3. Nineveh, the capital built by Sennacherib 298, 2510; destruction by the Medes 2191.
      4. Artistic advancement especially marked by Sculptures depicting the conquests 298, 3155–6, 296 (picture), 1206 (picture); use of Stone in Building 176; Painting 2628; Engraving 1168; Library at Nineveh 1992.

   **Note:** It is important to keep in mind that slavery was an essential part of all ancient civilizations; the conquered people formed the slave class and without them the great construction projects would have been impossible.

d. **Chaldean Empire—Last Semitic Empire: 298.**
   1. Babylon rebuilt 298, 294, 176; Famous Hanging Gardens 3177–8, 3179 (picture); Nebuchadnezzar's Canal 625, 1187.
   2. Babylonian Captivity of the Jews, which did much to advance Hebrew culture: 1891.

B. **Syria—The Western End of the Fertile Crescent: 3425–6.**
   a. **Phoenicians—the Early Traders who Carried the Alphabet to all Civilized Lands: 2773–4.** Although they had built their cities on the "battle-ground of empires" these peaceful merchants suffered little from the successive conquests, for they were content to pay tribute to any conqueror as long as they were allowed to continue their trading enterprises.
   b. **Hebrews—A People who Retained an Intense Racial and Religious Unity Despite Conquests and Oppression: 1889–92.**
      1. Nomadic Wanderings begun by Abraham 2–3; terminated by Moses 2333.
      2. Kingdom established under David and his son Solomon 967, 3274; capital is Jerusalem 1886.
   c. **Philistines: 2770.** These cousins of the Cretans are the enemies of the Israelites of whom we read so much in the Bible.

C. **Asia Minor:**
   a. **Hittites: 1669.** Through their wars with the Hittites the Assyrians and Egyptians learned the use of iron for tools and weapons 1817, and the value of the horse 3524.
   b. **Lydians:** These people of Asia Minor rose to such prosperity that the name of their king, Croesus, is still the symbol for fabulous wealth 923; earliest known use of coins 2281.

D. **Indo-European Supremacy Supplants Semitic Power:** The Indo-European races moving southward from the mountains north of the Fertile Crescent belonged to the same race as the peoples of modern Europe.
   a. **The Medes: 2191.**
   b. **The Short-lived Persian Empire: 2737.**
      1. Religion of Zoroaster, the first universal religion: 3841.
      2. Rising power of Greece stays westward tide of Persian conquest: 2738–40.
      3. Alexander's conquest ends great Asiatic Empires: 86–7.

# The Greeks

I. **THE RISE OF EUROPEAN CIVILIZATION:**

A. **Aegean Civilization: 27–9, 918.** This civilization developed in Crete and spread over the Aegean World.
   a. **Effect on European Civilization: 1517, 27 map.** The islands of the Aegean were the stepping stones that brought civilization to Europe.
   b. **Discoveries of Archeologists:** Excavations of Henry Schliemann unlock storehouse of unsuspected treasures 3138, 3545, 29.

II. **GREEK INVASION OF THE AEGEAN WORLD:**

A. **Nomad Tribes from the North: 1518, 1520, 29.** The Greeks came down from the unknown North and conquered the Aegeans; in settling down they adopted much of the Aegean culture. The Greeks were a northern branch (Indo-European) of the same stock as the Medes and Persians (Indo-Iranians) who had invaded the Semitic world of western Asia.

B. **Homeric Age Marks the High Tide of the Migration: 1520.**
   a. **Trojan War: 3542–3.**
   b. **Culture of the Acheans:** An account of the culture of these early Greeks is preserved for us in the Iliad and Odyssey of Homer 1520, 1675–6.

III. **DEVELOPMENT OF GREEK CITY STATES:**

A. **Lack of Unity among the Greeks:** This is the keynote of Greek political history, and was largely due to geographical influences 1517–8, 1520.

B. **Evolution of Democracy: 1520–2.**
   a. **Athens, the Intellectual Leader of Greece: 1521–2.**
      —Reforms of Solon make Government more Democratic: 3274–5, 3655.
   b. **Sparta, the Military State: 3308–10.**
      —Lycurgus, the great law-giver: 2086.

**Note:** It must be remembered in discussing Greek Democracy that it was limited to an aristocratic class, the citizens of the states. In the Greek cities every man was not a citizen as is the case in most countries today; the greater part of the menial and skilled labor of Greece was done by slaved and free men who were not members of the exclusive body of citizens 1522, 3309.

IV. **PERSIAN WARS:**

A. **Greece Checks Persian Invasion and Saves Europe from Asiatic Domination: 2738, 1522.**
   a. **Famous Battles:** Marathon 2143; Salamis 3113, 195; Thermopylae 3487.
   b. **Leaders:** Themistocles 1522; Aristides 194.

B. **Results of the Wars:** They led to the foundation of the Delian Confederacy which became the Athenian Empire 195, 1522.

V. **AGE OF PERICLES OR THE "GOLDEN AGE" OF GREECE: 1522, 1524, 2729.**

A. **"Plain Living and High Thinking" in Ancient Athens: 1522, 1524.**

B. **Far-Reaching Effects of this Period:** It served to crystallize all the previous culture of Greece; it stimulated new and immortal achievements; and it established such high and firm standards in art, literature,

and philosophy that Greece continued to be the intellectual leader of the world long after the political power of the Greek states was broken.

VI. CULTURE OF THE GREEKS:
- A. Literature: **1534.**
  - a. Poetry: Homeric Epics **1675, 3542;** Lyric Poetry **1536.**
  - b. Drama Evolved from Dialogues and Choruses of Religious Festivals: **1031, 1536.**
    1. Aeschylus, Sophocles, Euripides, and Aristophanes: 1536–7.
    2. Greek Theaters: 3482, 3484.
  - c. Prose Developed by Historians and Orators: **1537, 3004–5.**
    1. Herodotus, the "father of history": 1645.
    2. Demosthenes, greatest of orators: 993.
- B. Art and Architecture: **1529, 176.**
  - a. Phidias, the Master Sculptor and Builder: **2759.**
  - b. Glories of the Acropolis: **10,** and **248, 250, 1517, 1532** (pictures).
- C. Music Among the Greeks: **2376.**
- D. Influence of Religion on Greek Life: **2385, 3607.** A survey of the Greek gods and goddesses will be found in the Mythology Outline.
  —Olympic Games 2580; Oracles 156, 991.
- E. The Work of the Philosophers: **1537–8.**
  —Socrates **3270;** Plato **2832;** Aristotle **195.**

VII. CIVIL WARS AND DECLINE OF THE POWER OF THE CITY STATES: **1524–5.**
- A. Peloponnesian Wars Establish Spartan Supremacy: **3310, 251.**
- B. Leadership Passes to Thebes: **3485.**

VIII. GREECE UNDER MACEDONIAN RULE:
- A. Philip of Macedon Builds up a Great Military Power: **1525, 2096.**
- B. Alexander, Philip's Son, Becomes a World Conqueror: **85–87.**
  - a. Subjugation of Persian Empire, Including Egypt: **86–87, 2738, 2774, 1106–7.**
  - b. Alexander Carries Greek Culture to Most of Known World: **1525, 251.**
- C. Sunset Glory of Greece—the Hellenistic Age: **1525–6.**
  - a. In Egypt: **1107, 2931, 789.**
    —Alexandria becomes literary and scientific capital of world: 88, 1992.
  - b. Art and Literature of Hellenistic Age: **1532, 1538.**
  - c. Development of Science: **1422, 1064, 1416, 174, 2931.**

IX. GRECIAN WORLD ABSORBED BY ROMAN EMPIRE: **1525–6.**

# Rise and Fall of the Roman Empire

I. BEGINNINGS OF ROME:
- A. Sunny Italy—the Generous Mistress of the Mediterranean: **1835.** Italy was more hospitable to the enterprises of men than Greece. The ridge of the Apennincs near the Adriatic Coast was a high garden wall which kept curious easterners from trespassing; the sunny hillsides sloping to the western Mediterranean could support a large population; communication was not difficult. If the lack of good harbors tended to keep the early Romans at home, it also kept invaders away.
- B. Inhabitants of Ancient Italy:
  - a. The Etruscans: **1185.** These were perhaps related to the Cretans.
  - b. The Latins: **3040.** These people entered Italy from the north in prehistoric times and belonged to the same stock (Indo-European) as the invaders of Greece.
- C. Founding of Rome: Nothing definite is known of the founding of Rome, as there is little historical evidence to support the legends of Aeneas or of Romulus and Remus 29, 3058.
- D. Progress and Prosperity of Rome under Etruscan Rule: **3041.**
- E. Etruscan Kings Expelled: **3041.** Story of Horatius 3494.

II. THE REPUBLIC:
- A. Long Fight Waged by Common People (Plebs) against the Ruling Aristocracy (Patricians) for Political Power: **3042–4.**
- B. Military Conquest and Territorial Expansion:
  - a. All Italy Comes Under Roman Rule: **3044.**
    1. Defeat of Pyrrhus at Beneventum leads to capture of Greek colonies: 2941.
    2. Wise political organizations of conquered territories aids governmental stability: 3045.
    3. Story of Cincinnatus: 766.
  - b. Triumph in Punic Wars Gives Rome Naval Supremacy: **3045–6.**
    1. Carthage—Its Rise and Fall: 650.
    2. Hannibal—a Genius in Victory and Defeat: 1575.
  - c. Other Conquests: With Carthage defeated, the way was now clear for the conquest of a Mediterranean empire; victory followed victory, and sooner or later most of the known world fell before the Roman legions: Syracuse 175; Spain 3303; Greece 1525–6; Pompey in the East 2878, 1891; Gaul 1352, 1445–6, 564, 674.

C. Collapse of the Republic:
a. **Causes of the Collapse: 3046.** Here again crops out that fundamental weakness of the ancient civilizations, the slave systems. The rich grew richer and the poor grew poorer, until they were worse off than the actual slaves in the rich man's home. The flooding of the slave market with military captives made the employment of free labor unprofitable. There was no stablizing "middle class," no newspapers, and no national school system to enlighten the public.
b. **Civil War, a Period of Personal Rivalries and Class Struggle: 3046.** During this scene many famous characters come onto the stage of history: Cicero 765; Pompey 2878; Antony and Cleopatra 789.
c. **Julius Caesar Masters the Roman World and Becomes "Imperator": 564, 3046.**

III. THE EMPIRE:
A. **First Century of Imperial Glory: 3046–7.**
a. **Augustus Encourages Era of Intellectual and Imperial Development: 257–8.**
b. **The Infamous Nero, the last of the Augustan Line, Ends the Century: 2436.**
B. **Second Century of Imperial Glory—Empire Reaches Greatest Extent: 3047–8, 3042** (map).
a. **Conquest of Britain: 1152.**
b. **Rule of Blood and Iron:** Destruction of Jerusalem 1891; Annihilation of Palmyra 2648.
c. **Ends with Marcus Aurelius, the Emperor-Philosopher: 2146.**
C. Life in Imperial Rome:
a. **Luxury the Keynote of Roman Life:** Everyday affairs in Pompeii 2875; classic fashions 879, 898 (picture); performances of gladiators 1466.
b. Practical Progress:
1. Modern improvements two thousand years ago: public baths 3052; sewerage systems 3183; aqueducts and water supply 163–4, 3702; tunnels 3552; dentistry 997; utensils 3045 (picture).
2. Greatest system of communication in the ancient world: roads 3046, 3526; postal service 2896; lighthouses 2004.
c. Artistic Achievements:
1. Roman architects modify Greek style and develop engineering technique: 177–8, 1149.
2. In sculpture and painting, also, the Romans followed Greek models: 1532–3.
d. **Literature: 1966–8.**
1. Golden Age of Latin Literature: 1966–7; Cicero the great stylist 765; Vergil the poet 3630.
2. Silver Age: 1967–8. Provincial writers came to the front 3303; 'Meditations' of Marcus Aurelius, a classic of all ages 2146.
e. **Religion:** In religion, too, the Romans borrowed from the Greeks. For a survey of Roman gods and goddesses consult the Mythology Outline.

IV. DECLINE AND FALL OF THE EMPIRE:
A. Internal Decay:
a. **Emperors under Control of Army: 3048.**
b. **Constantine Ends the Political Power of Rome by Removing Capital to Constantinople: 870.**
1. This paved the way for the formal division of the Empire: 1194.
2. Justinian I preserves Roman Law in famous code: 1905.
c. **The Byzantine Empire at Constantinople: 551.** This empire is chiefly interesting in connection with Roman history because it preserved for posterity the classic culture that was destroyed in Rome.
B. **The Coming of the Barbarians:** Beyond the last Roman outposts was ever a throng of restless people eager to push into the southern lands of sunshine and plenty. Centuries before, the Gauls had ravaged Italy and even sacked Rome 3044. With the weakening of the Roman military power these tribes began to pour into the Empire 1194, 1491.
C. Fall of Rome:
a. **Visigoth Victory at Adrianople Foreshadows Doom of Rome: 26.**
b. **Rome is Captured by Alaric: 73.**
c. **Pope Leo I Saves City from Ravages of Huns under Attila: 1704.**
d. **Theodoric, the Ostrogoth, Establishes Short-lived Rule in Italy: 1491, 2979.**
e. **Vandals Plunder by Land and by Sea: 3617.**
f. **Lombards Found Kingdom in Northern Italy: 2047.**
D. **The Christian Church Takes up the Burden Dropped by the Dying Empire: 763.**

# MEDIEVAL HISTORY

I. CHARLEMAGNE'S EMPIRE:
A. The Foundation of the Frankish Empire:
a. **Clovis Unites all Franks and Conquers Modern France: 1352, 810.** The conversion of Clovis to Orthodox Christianity was significant; it led to Frankish support of the Pope, whereas many of the other barbarians had tried to destroy the power of Rome.
b. **Charles Martel Saves Europe from Mohammedan Conquest at Tours: 697.**
B. **Charlemagne, the Empire Builder of the Middle Ages: 688.**
C. **Disruption of Charlemagne's Empire, the Starting Point of Modern Germany and France: 1195, 1352.** Charlemagne's son, Louis the Pious, was unable to maintain order in the vast domain left him, and upon

his death his three sons divided the lands between them—the Partition of Verdun. Louis the German received the portion beyond the Rhine; Charles the Bald, that west of the Rhone and Scheldt; Lothair, the middle strip including Italy. While these divisions soon yielded to the disintegrating influences of the feudal age, they were later partly revived.

II. THE MEDIEVAL CHURCH:
- A. **The Bishop of Rome, as Pope, Becomes the Most Powerful Ruler of the Middle Ages: 2664, 763.**
- B. **The Work of the Monks and the Monasteries: 2298, 455–6.**
  - a. **Missionary Enterprises: 636, 454, 1447.**
  - b. **The Friars 2300; Franciscans 1355.**

III. FEUDALISM:
- A. **The Result of the Collapse of the Roman Government: 1235.**
  - a. **General Causes of Feudalism:** This system was not peculiar to Europe; it has often grown up in countries where the central government has been weak: Egypt 1102; Japan 1868.
  - b. **The Castle, the Stronghold of Feudalism: 654.**
  - c. **Rule of "Might Makes Right":** In England 3352; in France 2064; in Germany 1447.
- B. **Life under the Feudal System:**
  - a. **"When Knighthood was in Flower": 1933.**
    1. Armor 214; heraldry 1639.
    2. Life in the castle 656; the importance of the minstrels 3039; 2377; courtly sport of falconry 1220.
  - b. **Country Life in Feudal Days:** System of land holding 1235; dependent position of serfs 3249; agricultural methods 48, 44 (picture).
  - c. **Town Life in Feudal Days: 769, 373, 1358.** Fairs and markets 1219; Flemish trade 372, 376; Hanseatic League 1576; trade with the East 904, 3317, 3385, 2723; gilds, the medieval forerunner of the trade unions 1459.
- C. **Decline of Feudalism: 1236.** Rise of the power of the towns 769–70; Black Death breaks down agricultural system 433; effects of Crusades 932; invention of gunpowder 1552; rise of infantry and professional armies 42, 1700; inventions which changed the tide of power 773.

IV. CULTURAL DEVELOPMENT OF THE MIDDLE AGES:
- A. **Literature Embodied in Minstrels' Songs: 3039, 2377, 2539.**
  - a. **Modern Survivals:** Tales of King Arthur 223; Robin Hood 3028; Song of Roland 3038; Reynard the Fox 1337.
  - b. **Froissart the Chronicler: 1375.**
  - c. **Books and Libraries: 455–6, 1992.**
- B. **Beginnings of the Modern Drama:** Pageants 2625; Miracle and Mystery plays 1033, 2259.
- C. **Architecture and Art:**
  - a. **The Soaring Gothic Architecture, the Embodiment of Medieval Idealism: 181.** Cathedrals 662; stained glass 1474; sculpture 3156.
  - b. **Other Arts:** Painting 2628; tapestries 3433, 1140; ivory carving 1854; illumination of books 455–6.
- D. **Living Conditions:** Meager house furnishings 1383; floor coverings 3079; poor heating systems 3368; insanitary sewerage 3183; inadequate water supply 3702; table utensils 1937; limited diet 3317.
- E. **Education Carried on by the Church: 763.**
  - a. **Medieval Universities: 831, 2608, 450, 2390.**
  - b. **Importance of Abelard 2; Roger Bacon 301.**

V. THE CRUSADES:
- A. **The East at the Time of the Crusades:**
  - a. **Byzantine Empire, the Stronghold of Culture in Europe: 551.**
  - b. **Rising Tide of Mohammedanism: 2275, 1942.** Movement into Europe through Spain 2323, 3302; checked at Tours 697.
- B. **The Crusades: 929.**
  - a. **Causes of the Crusades:** Seljuk Turks capture Jerusalem, threaten Constantinople, and stop pilgrimages to Palestine 929; pilgrimages—an important feature of medieval life 2807.
  - b. **General Character of the Crusades:**
    1. Famous leaders: Richard the Lion Hearted 3015; Saladin 3111; Louis IX of France 2064; Frederick Barbarossa 1358; Philip Augustus 2762.
    2. Corruption into economic crusades: 552, 3625, 918, 947.
    3. Part played by Crusading Orders: 932, 930, 2131.
- C. **Effects of the Crusades upon Europe: 932.** Agriculture improved by introduction of new plants 2278, 1674; use of Arabic notation 2543; influence on architecture 181.

VI. GROWTH OF MONARCHY IN FRANCE:
- A. **Capetian Kings Begin Unification of France: 1195, 1352.** When Hugh Capet came to the throne, feudalism was at its height; the kingly power was disputed by great barons of whom the duke of Normandy was the most powerful; Henry I fails to subdue vassals 1636; how the Northmen conquered Normandy 2513, 2526.
  - a. **Louis the Fat Brings Order to France by Defeating Feudal Barons: 2064.**
  - b. **Philip Augustus Conquers Normandy from John of England: 2762, 2513.** Normandy became an English possession when the duke of Normandy became king of England 2513.
  - c. **Administrative Reforms of Louis the Saint: 2064.**
  - d. **Philip the Fair: 2762.** Calls the first Estates-General 1178.

B. **Hundred Years' War: 1699.**
   a. **Causes of the War: 1699.** English claims to France 2763.
   b. **How the War was Fought:**
      1. Royal leaders: 694, 1088, 1634.
      2. Important battles: Crécy 1699, 635, 1552; Poitiers 1700; Agincourt 42, 1634; first use of cannon 635–6.
      3. How Joan of Arc Saved France: 1893, 694.
   c. **Results of the War: 1700, 1352, 1634, 2763.**

C. **Growth of Absolute Monarchy under Louis XI: 2065, 220.** Defeat of Charles the Bold, the powerful duke of Burgundy 697.

VII. ENGLAND IN THE MIDDLE AGES:

A. **Early History:**
   a. **Roman Briton: 1152.**
   b. **Anglo-Saxon Period:** Teutonic invasion 1152, 674; Christianity returns 636; Alfred, the first great English king 90; Danish Invasions 1152, 90, 1087; Canute rules all England 639; Edward the Confessor restores Saxon line 1087.

B. **Norman Conquest:**
   a. **Normans under William the Conqueror defeat Harold at Hastings: 3739, 1595.** Death of Harold, last Saxon king 1589.
   b. **Norman Rule Established: 1153.** Feudalism reaches height under Stephen 3740, 1633, 3352.
   c. **Results of Conquest:** While the Norman Conquest brought continental influences to England, in the end the Normans became English 2513.

C. **Growth of Constitutional Government: 1153.** In this connection it should be thoroughly understood that in England there is no written constitution similar to that of the United States. There, constitutional government means government according to a body of laws, customs, and court decisions that have gradually become established by centuries of usage.
   a. **Beginning of Systematic Government under Henry II: 1633.**
      1. Attempt to regulate the clergy fails 358; jury trials extended 1905.
      2. Administrative methods continued by Richard I: 3015.
   b. **Magna Carta, the Great Charter that Made the King Amenable to the Law: 2121.** Extorted from John by rebellious barons: 1895.
   c. **Growth of Parliamentary Power:**
      1. How Simon de Montfort called the First Parliament 2316, 2687; Result of Barons' war against Henry III: 1634.
      2. Model Parliament, so called because it was model for succeeding parliaments 2687; Edward I encourages idea of law and order 1087.
      3. Parliament divided into two houses: 2687.
      4. Parliament, under Edward II, begins to restrict the power of the king 1088; quarrels with Richard II: 3016.

D. **England Reaches out for More Territory:**
   a. **Edward I Attempts to Unite Scotland and England 3148, 1088.** Resisted by Wallace and Bruce, great Scotch heroes: 3667, 518.
   b. **Conquest of Wales: 3664, 1087.**
   c. **In France, the Loss of Normandy under John Left Aquitaine Chief English Possession: 1088, 2513.**

E. **Struggle for Social Justice—Beginning of Conflict between Capital and Labor:** Black Death causes decline of serfdom 433; Peasants' Revolt 3571.

F. **Birth of a National Spirit:**
   a. **Effect of the Hundred Years' War:** This long struggle was largely carried on by the English people united by a common interest, not by a body of personal retainers to further the designs of some feudal lord. The success of their military operations was due to the English archers, who were sturdy yeomen, the foundation of Britain's great middle class.
   b. **English Becomes the Official Language: 1162.**
   c. **Beginnings of a National Literature: 1163.** Chaucer, the Father of English Poetry 701; Wyclif's English Bible 3817.

G. **Wars of the Roses: 3066, 3016, 1635.** Resulted in establishing of powerful Tudor monarchy 3547; Court of Star Chamber 3344.

VIII. THE EMPIRE AND THE PAPACY:

A. **The Beginnings of the Holy Roman Empire: 1674.**
   a. **Coronation of Charlemagne, the "Central Fact of the Middle Ages": 688.**
   b. **Character of the Conflict between Popes and Emperors: 1674.** Since both Pope and Emperor claimed that their power was derived from God, a difference in interests was bound to lead to a conflict.
   c. **Revived under Otto I: 2606, 1842.** For the next few centuries the history of Germany and Italy became that of the Empire and the Papacy.

B. **Great Investiture Conflict:**
   a. **Begun by Henry IV and Pope Gregory VII (Hildebrand): 1632, 1541.** Settled by Concordat of Worms 1633.
   b. **Conflict in England: 3740.**

C. Quarrels of the Hohenstaufens and the Popes:
  a. **Fundamental Causes:** The secret of the hereditary feud lay in the fact that the office of Emperor was at least theoretically elective, and the Guelfs disputed the claims of the Hohenstaufens (Ghibellines). Since the coronation of the Emperor by the Pope was necessary to the imperial power, the Pope was forced to take sides in the disputes. It was inevitable that he should generally oppose the Hohenstaufens who were the most formidable rivals of the papacy in the struggle for power 1546.
  b. **Frederick Barbarossa, One of the Greatest of the Emperors: 1358.**
  c. **Innocent III strengthens the Papal Position: 1780.**
    1. Humbles John of England: 1896.
    2. Dominates selection of Emperors: 2606.
  d. **Frederick II Restores Hohenstaufen House: 1358.** Cultural development of this period in Naples and Sicily 2391, 3230.

D. **Golden Bull Establishes a "Constitution" for the Empire: 1675.** Hinders growth of centralized government in Germany 1447.

IX. FALL OF THE EASTERN (BYZANTINE) EMPIRE:
  A. **Rise of the Ottoman Turks: 3559.**
  B. **Fall of Constantinople: 871, 552, 3559.** This put an end to the Bzyantine Empire and gave the Turks undisputed control of the eastern Mediterranean and of a large corner of Europe; but indirectly it stimulated the era of exploration and discovery by forcing western Europe to abandon the old Mediterranean trade routes and seek new ways of reaching the Far East.

# MODERN HISTORY

## The Renaissance

I. FORERUNNERS AND CONTRIBUTING CAUSES:
  A. **Crusades—Contact with Eastern Culture Stimulated Thought of Crusaders: 932.**
  B. **Invention of Printing and More General Use of Paper Promoted Interchange of Ideas: 2916, 2667.**
  C. **Growth of Creative Impulse as Shown in Medieval Architecture: 182, 184.**

II. LITERARY RENAISSANCE: Study of classical learning and beginnings of national literatures 2995.
  A. **In Italy: 2995–6, 1832–3.**
    a. **Dante the Forerunner of the Renaissance: 957.**
    b. **Distinctly National Literature Hampered by Revival of Greek and Latin: 1833.**
  B. **North of the Alps: 2996.**
    a. **France: 1364. Froissart the chronicler 1375.**
    b. **England: 1163–4, 1635.** Early influence of Chaucer and Wyclif on English language 702, 3817; Sir Thomas More and the Oxford Reformers 2325.

III. ARTISTIC RENAISSANCE:
  A. **In Italy: 2996–7, 2628–30, 3156–8.**
    a. **Florence the Center of the Movement: 1293–4.** Patronage of the Medici 2191.
    b. **Italian Masters:** Giotto 1461; Ghiberti 1456; Leonardo da Vinci 3643; Michelangelo 2220; Raphael 2976; Titian 3504–5.
    c. **The Church a Patron of Art:** The Borgias 467; Pope Julius II 1902; Leo X 1988.
  B. **Northern Artists: 2997.** Dürer 1048; Holbein 1672.
  C. **Architecture:** Return to the classic styles: 188.

IV. BEGINNINGS OF SCIENCE:
  A. **Roger Bacon, Who Foreshadowed Experimental Science: 301, 2787, 712** (picture).
  B. **Advance in Astronomy: 773, 774.**
    a. **Copernicus, the Founder of Modern Astronomy: 880.**
    b. **Galileo Continues Work of Copernicus: 1391, 1508, 2787.**
  C. **Important Inventions: 773. Compass 853, gunpowder 1552.**

V. EXPLORATIONS AND DISCOVERIES: **1416, 773.**
  A. **Prince Henry the Navigator and the Portuguese in the East: 1638–9.**
    a. **Bartholomew Diaz Discovers the Cape of Good Hope: 640, 3279.**
    b. **Vasco da Gama Reaches India: 1392.**
  B. **Columbus Discovers America: 846.**
  C. **Magellan Circumnavigates the World: 2115.**

**Note:** In the Geography Outline under the section devoted to each continent will be found further references dealing with the discoveries, explorations, and colonial enterprises of this and later periods.

## The Reformation and Religious Wars

I. CAUSES OF THE REFORMATION:
  A. **Effect of the Renaissance: 2996.** Social and political unrest in Germany 2987; printing and translation of Bible into National Languages 389.
  B. **Forerunners of the Reformation:** Wyclif and the Lollards 3817; John Huss attacks corruption of the Church in Bohemia 1705; influence of the conservative Erasmus 2996.

II. POLITICAL AND SOCIAL CONDITIONS OF EUROPE:
- A. Consolidation of Spain: **3304.**
  - a. Marriage of Ferdinand and Isabella: **1832.**
  - b. Moorish Power Broken: **2323.**
  - c. Charles V Rules the Holy Roman Empire and all Hapsburg Possessions: **690.** The problem of defending his vast dominions against outside attaek kept Charles from dealing effectively with the soeial and religious ferment within 2988, 1195.
- B. French Designs on Italy: **696, 1354.**
  - a. Battle of Ravenna: **2979.**
  - b. Savonarola Preaches Moral and Religious Revival: **3130.**
  - c. Invasions of Italy Distract Attention from Religious Revolt: **1195.**

III. REFORMATION BEGINS IN GERMANY:
- A. Why Germany was Ready for the Reformation: **2987.**
- B. Luther and His Teachings: **2084, 2987.**
- C. Peace of Augsburg Ends Civil Wars: **2988.** Since this peace left to each ruler the right to establish either Lutheranism or Catholieism, the people who disagreed with their rulers were forced to emigrate.

IV. CALVINISM:
- A. In Switzerland:
  - a. Zwingli Preaches Radical Reform: **3842.** In the disagreement between Zwingli and Luther lay the germ of mueh future Protestant dissension.
  - b. Calvin and His Austere Teachings: **587.**
- B. Huguenots in France: **1696.**
  - a. Persecutions and St. Bartholomew's Massacre: **1637, 826, 696.**
  - b. Henry IV and Edict of Nantes: **1696.**
  - c. Richelieu Destroys Political Power of Huguenots: **3018.**
- C. In Scotland: **3148.**
  - —John Knox Founds Scotch Presbyterianism: **1941.**

V. REFORMATION IN ENGLAND:
- A. Henry VIII's Divorce Case Leads to Break with Rome: **1636, 3776.**
  - a. Opposition of Thomas More: **2325.**
  - b. Underlying Issues: The changes under Henry VIII had to do with Papal control rather than religious reform 1636; Protestant doctrines had little influence before Edward VI. 1089.
- B. Catholic Reaction under Queen Mary: **2157, 1136.** Tragedy of Lady Jane Grey 1542.
- C. Elizabeth Secures England's Position as Protestant Kingdom: **1136.**
  - a. Mary Queen of Scots, Center of Catholic Movement: **2158.**
  - b. Defeat of Spanish Armada: **210.** This marked the beginning of British sea-power 1030, 2763.
  - c. Elizabethan Age in Literature: **1164, 2539.** Shakespeare 3188; Francis Bacon 300.

# Period of Civil Strife

I. QUARRELS IN ENGLAND BETWEEN STUART KINGS AND PARLIAMENT:
- A. James I Attempts to Rule by "Divine Right": **1860.**
- B. Charles I Continues the Policy: **691–3.** John Hampden leads resistance to ship money 1570; Long Parliament begins 2689.
- C. Failure to Settle Religious Question:
  - a. Gunpowder Plot to Blow up Parliament: **1228.**
  - b. Persecution of Puritans and "Great Migration": **2937, 2175.**
  - c. Bishops' Wars in Scotland: **3148.**

II. CIVIL WAR, COMMONWEALTH, AND PROTECTORATE:
- A. Parliament Leads War Against King: **924–5, 693, 3149.** Scotland aids Parliament: 3148–9.
- B. Cromwell in Power: **924.** King Charles is put to death **693.**
  - a. Irish Rebellion Crushed: **1808.**
  - b. Growth of Sea-Power in War with Netherlands: **435, 2442.**

III. THE RESTORATION:
- A. Charles II Seeks Absolute Power: **694.** Habeas Corpus Act Passed 1557.
- B. James II's Attempt to Secure Catholic Restoration Brings Revolution: **1861.** Stuart Claims upheld by "Pretenders." 2914.
- C. Age of Puritan and Cavalier in Literature: **1164–5.**
  - a. Influence of King James' Bible: **389.**
  - b. Great Puritan Writers: Milton **2240,** Bunyan **534.**

IV. SPAIN AND THE REVOLT OF THE PROTESTANT NETHERLANDS:
- A. Catholic Policy of Philip II: **2763, 3304.**
- B. Dutch Fight for Independence: **2442, 520.** William the Silent 3741; Treaty of Westphalia 3489.

V. COUNTER-REFORMATION:
- A. Earlier Attempts of Churchmen to End Abuses: Savonarola 3130; Ximenes 3823.
- B. Reformation within the Catholic Church: **2989.** Loyola and the Jesuits 2075; Franeis Xavier 3823.
- C. The Work of the Inquisition: **1780.**

VI. THE THIRTY YEARS' WAR:
- A. **Last Great Religious War Spreads from German Empire into All Europe: 3488.**
  - a. **Gustavus Adolphus, the Protestant Champion: 1553.** Originates modern army 218.
  - b. **Richelieu, French Cardinal and Statesman, Aids Protestant Cause: 3018, 3488.** By this time the religious significance of the War had been forgotten.
- B. Results of War:
  - a. **Religious Question Settled in Germany: 3489.**
  - b. **Political Adjustments: 3489, 1195.**
  - c. **Terrific Devastation of Invaded Countries: 3488–9, 448.**

# Struggle for Power and Possessions

I. THE AGE OF LOUIS XIV IN FRANCE:
- A. **Louis XIV, "the Grand Monarch": 2065.**
  - a. **Inherits Strong Monarchy Built by Richelieu and Mazarin: 3017, 2065.** Absolutism illustrated by incident of the "Man in the Iron Mask" 1827.
  - b. **Internal Administration under Colbert: 824–5, 1346.** Persecution of the Huguenots 1696.
  - c. **Foreign Policy—Wars to Extend French Power: 2065–6.** Louis did not scruple to use bribery as well as armies to advance his policies; he systematically paid foreign court officials and even rulers to support his cause, as in the case of James II, king of England 1861.
- B. **French Society during Reign of Louis XIV.**
  - a. **Court at Versailles: 3633.**
    1. Spectacular extravagance: Marriage to Infanta of Spain 3620.
    2. Influence of Madam de Maintenon: 2129.
  - b. **Golden Age of French Literature: 1364–5.** Corneille 891; Molière 2279; Racine 2957; Madame de Sévigné 3181; Voltaire 3660.

II. STRUGGLE FOR BALANCE OF POWER:
- A. **What "Balance of Power" Means:** In the 17th century there appears in European politics a new factor, known as the "Balance of Power." Briefly, this meant the maintenance of a balance of equality between the great nations of Europe. In other words, the principle implied that no ruler or country was to be allowed to expand in power so as to overshadow the rest. At this particular period it was Louis XIV who threatened the balance of power.
- B. **War of the Spanish Succession: 2066, 1156.**
  - a. **Marlborough, the Great English General: 2150.**
  - b. **Results of the Treaty of Utrecht: 3004, 3612, 139, 2763.**
- C. **War of the Austrian Succession: 2147, 3180.**
- D. **Seven Years' War: 3180.**
  - a. **Preceded by Diplomatic Revolution:** France and Austria against Prussia and Great Britain: 2147; importance of Chatham 700; weak rule of Louis XV 2066.
  - b. **Overseas Contest:** In America 1362; in India 1753, 573, 796, 382.
  - c. **Results of the War: 3180.** Extension of British Empire 513; losses of France 2066; gains of Prussia 1360–1.

III. CONSTITUTIONAL MONARCHY ESTABLISHED IN ENGLAND:
- A. **England Following the Revolution against James II:**
  - a. **Protestant Rule Reëstablished by William and Mary: 3740.** Bill of Rights fixes supremacy of Parliament 393; Toleration Act begins peaceful adjustment of religious rights 2937.
  - b. **Union of Scotland and England: 139, 3149.**
  - c. **Age of Queen Anne: 139.**
    1. Marlborough and the War of the Spanish Succession: 2150.
    2. Period of intellectual activity: 1165; rise of newspapers and periodicals 2474, 1178; Dryden 1043; Pope 2879; Swift 3406; Sir Isaac Newton 2476.
- B. **Limitation of King's Power under Early Hanoverians:**
  - a. **Growth of Cabinet Government: 1428, 555.** Work of Lord Chatham 700.
  - b. **Whigs Strengthen Position of House of Commons: 2869.**
- C. **Reaction under George III: 1428, 1430.**
  - a. **Dismissal of Chatham and Close of Seven Years' War: 700, 3180.**
  - b. **Failure of Tory Colonial Policy: 2869, 3338.**
    —Burke, the Champion of Whig Policies toward America: 540.
  - c. **Wars with Revolutionary France and Napoleon: 1368, 1370, 2393–6.**
    1. Work of William Pitt: 2812.
    2. Nelson secures British supremacy of the seas: 2427.
    3. War of 1812 with United States: 3670–3.
    4. Wellington and the battle of Waterloo: 3717, 3699.

IV. RACE FOR COLONIAL EMPIRES:
- A. **Results of Discoveries:** It was the inevitable result of the discoveries in the western hemisphere that each European country should hasten to seize as much as possible of the New World. Claims to the new territories were based upon priority of discovery and settlement.

B. SPANISH AMERICA:
  a. **Columbus Establishes Spanish Claim to New World: 846.** Explorations continued by Balboa 305–6; Ponce de Leon 2878; Vespucius 3634; De Soto 999; Coronado 892.
  b. **Spain Establishes Vast Colonial Empire:** South America 3289; West Indies 3718; Central America 680; Mexico 2214; St. Augustine 3106; Santa Fe 2466.
    1. Conquest of native peoples: Cortez in Mexico 894–5; Pizarro in Peru 2814.
    2. Las Casas work for the Indians: 1965.
  c. **Spanish Colonial Policy one of Ruthless Exploitation: 3870, 3891–2.**

C. **Portugal Obtains Great Colony of Brazil: 496.**

D. **French in North America: 617.**
  a. **Early Explorations:** Cartier 651; Champlain 686; Marquette and Joliet 2151, 1900; La Salle 1964.
  b. **Huguenots Attempt Settlements in South Carolina and Florida: 826.**

E. **British Exploration and Settlement: 616–7.**
  a. **Early Voyages the Basis of English Claims:** The Cabots 561; Drake 1030; Hudson's Explorations 1690.
  b. **Early Colonizing Enterprises:** Raleigh's Lost Colony 2520–1, 2974; Founding of the Thirteen Colonies 3602; Hudson's Bay Company 1692.

  **Note:** For further details of British settlements in North America see Outlines on history of United States and Canada.

F. **Other Settlements in North America:**
  a. **Dutch Colonies in New World: 2496–7, 989.**
  b. **Swedes Attempt to Gain Foothold: 989.**

G. **Colonial Results of the Struggle between England and France: 3180.**
  a. **In America:** French and Indian War and Freneh Loss of Canada 1362, 2538.
  b. **In the Far East:**
    1. General Situation in the East Indies 1072–3; Ceylon 685; effects of spice trade 3317.
    2. Freneh and British in India 1752–3; Clive establishes British rule 795, 3180, 573, 382; Warren Hastings continues Clive's work 1596.

# Rise of Prussia and Russia

I. THE BEGINNINGS OF PRUSSIAN POWER:
  A. **Early Duchy of Prussia under the Hohenzollerns: 2928–9, 1672.** Prussia had been converted to Christianity by Teutonic Knights 932, 1195.
  B. **Frederick the Great Raises Prussia to State of First Rank: 1360.**
    a. **Seizure of Silesia and Seven Years' War: 2147, 3180.**
    b. **Partition of Poland: 2856.**

II. FORMATION OF THE RUSSIAN EMPIRE:
  A. **Russia before Peter the Great: 3089.**
    a. **Early Leadership of Kief: 1922, 3096.**
    b. **Mongol Invasion Shuts off Contact with Western Europe: 2285, 3096–7.**
    c. **Grand Dukes of Moscovy Reorganize Russia: 1853.**
  B. **Peter the Great—How One Man Lashed a Medieval Empire into a Modern State: 2745, 3090.**
    a. **Defeat of Charles XII of Sweden: 698.**
    b. **Baltic Provinces Annexed: 1180, 1969, 2747.**
  C. **Catherine II Continues Peters' Policies: 3090.**
    a. **Seven Years' War: 3180, 2147.**
    b. **Shares in Partition of Poland: 2856; Kosciusko 1944.**
    c. **Ambitions along the Black Sea: 2560.**

III. LESSER EUROPEAN STATES IN EIGHTEENTH CENTURY:
  A. **Decline of Spanish Power: 3304.**
  B. **Italy Without Political Unity: 1836–7.** Bourbons succeed Hapsburgs in Naples and Sicily 2391, 3230.
  C. **Weakness of Austria:** After the death of Emperor Charles V, Austria was ruled by the Austrian branch of the Hapsburgs 273, 1578.
    a. **Lack of Racial Unity: 273.**
    b. **Able Reign of Maria Theresa: 2147, 273.** Loss of Silesia 1361; Seven Years' War 3180; partition of Poland 2856, 2147.

# French Revolution and Napoleon

I. REVOLUTION IN FRANCE: 1366.
  A. **Sources of the Revolutionary Movement:**
    a. **Influence of Liberal Thinkers:** Voltaire 3661; Rousseau 3070; the Encyclopedists 1367, 1365.
    b. **Growing Dissatisfaction with the Abuses of the Old Régime: 1366–7, 1352.**
    c. **Failure of Reforms under Louis XVI: 2066, 1367.** Influence of Marie Antoinette 2148.
  B. **Overthrow of the Old Régime:**
    a. **Meeting of the Estates-General: 1367, 1179.** Bastile stormed and social revolution 1368; serfdom ended 3249; royal family escorted to Paris 2148.

b. **Constitution Drawn Up: 1368.** Declaration of the Rights of Man 393, 3778.
c. **Leaders:** Mirabeau 2259; Lafayette 1956; Talleyrand 3430.
d. **Flight of King Leads to Abolition of Monarchy: 2067, 1368.** Execution of Louis XVI 2067.

C. **Reign of Terror, Government by the Convention: 1370.**
a. **Dominated by Jacobins: 1859.** Robespierre 3027; Danton 961.
b. **Control Maintained by Terrorism:** Execution of Lavoisier 1249; Madame Roland 3039; Marie Antoinette 2148.

D. **Directory Established: 1370.**
a. **Wars with Foreign Powers:** The hostility of France's neighbors to the revolutionary spirit had brought on a whole series of wars 1366, 1368, 2442.
b. **Napoleon Bonaparte, the "Man of the Hour": 2391.**
1. Early life and education 2391–2; marriage to Josephine Beauharnais 1901.
2. Campaigns under the Directory 2392–3; Egyptian Campaign 2435, 1107.

II. NAPOLEONIC ERA:

A. **Bonaparte Overthrows the Directory and Establishes the Consulate: 2393–4.**
a. **Wars against Second Coalition: 2394.**
b. **Battle of the Baltic: 321; Peace of Amiens: 117.**

B. **Napoleonic Empire:**
a. **Imperial Conquests Extended over most of Europe: 2394, 2396.** Naval power crushed at Trafalgar: 2435–6, 1154.
b. **Napoleon's Work as a Statesman: 2394–6.**
c. **Effects of Continental System:** In Europe 2396, 85; in United States 1140, 3670, 3671.

C. **National Uprisings and Military Reverses Lead to Napoleon's Downfall: 2396.**
a. **Peninsular War 2890, 3717; Retreat from Moscow 2501, 2333.**
b. **Exile to Elba: 2396.**
c. **Hundred Days and Waterloo: 2396, 2067, 3699.**

III. CONGRESS OF VIENNA AND PERIOD OF REACTION:

A. **Partition of Napoleonic Empire among European powers: 1196, 3642.** Talleyrand's work for France: 3430.

B. **Formation of Grand and Holy Alliances: 85.** The Quadruple (Grand) Alliance was formed by Austria, Russia, Prussia, and Great Britain; the latter subsequently withdrew, and France was included.

**Note:** In reconstructing Europe the Congress of Vienna was guided by dynastic rather than national claims; the rights of the peoples were entirely ignored. The representatives of the old aristocracy in seeking to restore the "balance of power" sowed the seeds of later conflicts.

C. **Age of Metternich:**
a. **Metternich's Influence:** For thirty years after the Congress of Vienna, the moving spirit of European politics was Prince Metternich, the famous Austrian statesman. "As a diplomat, he dictated international policies for a generation; as a statesman, his advice was eagerly sought by the restored princes to whom he became guide, philosopher, and friend." He was "the consistent foe of democracy in every form whatsoever; and the system established by the Congress of Vienna was to him the last word in political wisdom. He set his face like flint against any suggestions of change."
b. **Metternich's Methods:** Through the Grand Alliance Metternich sought to extend his system by frequent congresses of interested powers and even armed intervention where revolutionary movements seemed serious.
1. In Austria and Germany all liberal movements were successfully smothered.
2. The Carbonari in Italy secretly spread the principles of liberalism: 1837.
3. Extreme reactionary policies of the restored Bourbon king of Spain let to a revolt and civil war which was put down by a French army.
4. The protest of Great Britain and the United States kept the Alliance from interfering in the revolts of the Spanish-American countries 2307.
c. **Decline of Reactionary Power:**
1. Great Britain joins United States in Monroe Doctrine: 2307
2. Russia supports Greece in War of Independence: 1526.
3. Revolution of 1830 in France overthrows Charles X: 696.

# Industrial Revolution

I. OLD INDUSTRIAL CONDITIONS: In order to understand the tremendous effects of the Industrial Revolution, it must be remembered that the Renaissance with all its stimulus to intellectual and political thought had had little effect on the every-day life of the people. Nearly all the work of the world was done by hand labor with a few inefficient tools, much as it had been done for centuries 1778; communication was slow and hazardous 3526, 1797; the masses of the people continued to live in the Middle Ages. Then, in about a generation, the adoption of a few practical inventions changed radically most of the conditions of life.

II. HOW THE CHANGE WAS BROUGHT ABOUT:

A. **Inventions in Spinning and Weaving: 3326–7.**
a. **Hargreaves' Spinning Jenny: 1589.** Improvements by Arkwright and Crompton 210, 923.
b. **Cartwright's Power Loom: 652.**
c. **Whitney's Cotton Gin Adds Impetus to Textile Industry: 3735–6.**

B. Invention of Steam Engine Fills Great Industrial Need: **3348.** Watt, father of the steam engine **3704–5.**
C. Rise of the Factory System: **1218.**
D. Improvement in Communications:
  a. Building of Roads and Canals: **3024, 625–6.**
  b. Application of Steam Engine to Problems of Transportation: **3210.**
    1. Fulton's work with the Steamboat: 1381.
    2. Locomotives and Railroads: 2962, 2043. Stephenson's Locomotive: 3353.
  c. Use of Electricity:
    1. Morse invents telegraph: 3454, 2330.
    2. Submarine cables unite continents: 558–61.
E. Improvement of Agricultural Methods: **43, 48.** Better plows: 2839; reaping machines 2095.

III. SOME RESULTS OF THE INDUSTRIAL REVOLUTION:
A. Economic: **1778.**
  a. Growth of Cities: **770.**
  b. Factory System and its Problems: **1218.**
    1. Medieval Apprentice system ended: 3655.
    2. Child labor a social menace: 728–9.
    3. Growth of union labor movement: 1947.
B. Influence upon Literature: **1036, 2540.**

# Europe in the Nineteenth Century

I. DEMOCRACY AND REACTION IN FRANCE:
A. Bourbon Restoration under Louis XVIII: **2067.** Reactionary policies of Charles X and the Revolution of 1830: 696.
B. Louis Philippe, the Citizen King: **2067.**
C. Revolution of 1848 and Second Republic: **1353, 2397.**
D. Napoleon III and the Second Empire: **2397.**
  a. Foreign Policy: Participates in Crimean War 922, 3560; aids Italy against Austria 670, 1837, 3638; interferes in Mexico 1898, 2216.
  b. Domestic Administration Marked by Prosperity and Public Improvements: Paris rebuilt 2685.
E. Franco-Prussian War and the Third Republic:
  a. Germany Crushes France in Franco-Prussian War: **1355, 1448–9.** Siege of Metz 2207; disaster at Sedan 3171, 2397.
  b. Third Republic: **1353.** Commune of Paris suppressed: 1356, 2685.

II. FOUNDING OF THE GERMAN EMPIRE:
A. Revolution of 1848 Seeks Democratic and United Government: **1448, 2929.** Political refugees after failure of revolution began great German immigration to United States 3737, 3772, 1357.
B. Bismarck Builds up Prussia's Power: **427, 2929, 1448.** Schleswig-Holstein seized 994, 997; Seven Weeks' War with Austria and formation of North German Confederation 1448.
C. Franco-Prussian War and Empire Proclaimed:
  a. Germany Defeats France in Short Campaign: **1355, 427–8.**
  b. Germany United as a Hohenzollern Empire: **1449, 3633, 3737–8.**

III. FORMATION OF AUSTRIA-HUNGARY:
A. Revolution of 1848 in Hapsburg Lands:
  a. Kossuth and Hungarian Republic: **1945, 1703.**
  b. Insurrection in Italy Led by Sardinia-Piedmont: **1837.**
  c. Revolt in Bohemia: **447.**
B. Francis Joseph Begins Long Reign: **1354.**
  a. Loss of Italian Provinces: **1837, 670, 1399, 3638.**
  b. Defeated by Prussia in Seven Weeks' War: **1448, 428.**
C. Dual Monarchy Formed: **1703, 273.**

IV. UNIFICATION OF ITALY: **1837–8.**
A. Mazzini and the Republic of Rome: **2178.**
B. Sardinian Leadership under Victor Emmanuel and His Great Minister, Cavour: **3638, 670.**
  a. Garibaldi and His "Thousand Red-Shirts": **1399.**
  b. Why the Pope Opposed the New Kingdom: **2813–4.**

V. GREAT BRITAIN IN THE NINETEENTH CENTURY:
A. Beginnings of Political and Social Reforms:
  a. Industrial Revolution Brings Demand for More Democratic Government and Remedy of Social Abuses: **1778, 1154–5.**
  b. Catholic Emancipation Act: **2559, 2706.** The laws prohibiting "Dissenters" from holding office had already been repealed; in 1858 political privileges were extended to the Jews.
  c. Parliamentary Reform Act of 1832 Transfers Political Power to Middle Classes: **2688, 3083, 2869.**
  d. Factory Laws: **1218, 729;** Poor Relief: **2878.**
  e. Repeal of Corn Laws and Establishing of Free Trade: **1155, 2706, 2869.**

B. Victorian Age:
  a. Influence of Queen Victoria: **3639.**
  b. Reflected in Literature: **1167.**
C. Victorian Foreign Policies:
  a. Crimean War and the Integrity of Turkey: **3560, 922, 3084.**
  b. Attitude towards the American Civil War: **12, 781, 3084, 1468.** Arbitration of Alabama Claims: 73.
D. Continuation of Reform Movement:
  a. Political Reforms: Suffrage extended 2688; women's suffrage 3779; adoption of secret method of voting 321, 1468; veto power of the House of Lords restricted: 2688, 2040.
  b. Social Reforms: Employers' liability act 1145; old age pensions 2722; trade unions given legal status 1947; Lloyd George's land reform and social legislation 2040.
  c. Religious Reform: Disestablishment of the Irish Church 1468, 1811; religious qualifications removed from Universities 1468; Welsh Church disestablished 3665.
  d. The Irish Question: **1811.** Gladstone's attempt to solve it 1468–9; work of Parnell 2689–90, 476.
E. Growth of the Empire: **513–4, 837.**
  a. Disraeli Lays Foundation for Modern British Imperialism: **1013.** Control of Suez Canal 3384.
  b. British Public "Discovers" India in Sepoy Rebellion: **1753–4.** Victoria crowned Empress 3640.

VI. OTHER EUROPEAN COUNTRIES IN NINETEENTH CENTURY:
A. Scandinavian Countries:
  a. Denmark: Loses Norway after Napoleonic Wars 997, 2536; Prussia and Austria seize Schleswig-Holstein: 428, 757.
  b. Sweden: **3404–5.** Loss of Finland 1248; loss of Norway 2536.
  c. Norway becomes an Independent Kingdom: **2536.**
B. Iberian Peninsula:
  a. Spain Loses Most of Colonial Empire: **3304, 3306.** See also articles on Mexico, Central America, and South American countries for details of the colonial revolutions.
    1. Insurrections in Cuba and War with United States: 938, 3306–7.
    2. Alfonso XIII begins task of modernizing country: 90.
  b. Portugal: **2890–1.** Revolution of 1910: 2026.
C. Belgium and Holland:
  a. Belgium Revolts from Netherlands: **2442, 1196, 520.**
  b. Kingdom of Belgium: **376.** Scheldt River controversy 3136; Leopold II secures Congo region: 40, 859.

# Awakening of the Far East

I. EUROPEANS IN CHINA:
A. China Opened to Foreigners through Treaty Ports: **746, 3498.** Great Britain obtains Hongkong through Opium War 1679, 2585.
B. Exploitation by Foreign Powers: **748.**
  a. Defeat by Japan Leads to Foreign Intervention: **1869–70.**
  b. German Holdings in Shantung: **3195.**
  c. Manchuria Falls under Russian and Later under Japanese Influence: **3098, 2134.**
  d. "Open Door" Agreement Saves National Integrity: **3606.**
C. Revolution Establishes Republican Government: **746.**

II. RUSSIA TURNS TO THE EAST:
A. Reaction in Russia after the Crimean War: **3090–2.**
  a. Alexander, the "Czar Liberator," Frees the Serfs: **85.**
  b. Return of Tyrannical Policies: **85, 2506.**
    1. Influences of Nihilist Movement: 3097.
    2. Tolstoy, the voice of Russia: 3512.
B. Advance in Asia:
  a. March to the Pacific:
    1. Trans-Siberian Railroad links Petrograd with the Pacific: 3228, 233.
    2. Port Arthur appropriated: 1870.
    3. Influence extended through Manchuria: 3098.
  b. Central Asia:
    1. Conquest of Trans-Caucasia and Turkestan: 664, 3555–6.
    2. Pressure on Indian-Border—buffer state of Afghanistan: 31.

III. TRANSFORMATION OF JAPAN:
A. Country opened to Foreigners: **1862, 3830.**
  a. Perry's Expedition: **1240.**
  b. Earlier Contact with Westerners: **1869, 3823.**
B. War with China, the Test of the New-found Power: **1869–70.** Chinese attitude toward Japan 748.
C. Russo-Japanese War Makes Japan a World Power: **3098.**
  a. Growth of Japanese Influence in Manchuria: **2135, 1870.**
  b. Annexation of Korea: **1943, 1944**

# Europe Before the World War

I. ARMED PEACE IN EUROPE:

A. **Triple Alliance between Germany, Austria, and Italy: 1196, 3529, 3795.** A serious weakness of this alliance lay in the fact that Italy was linked with her ancient enemy, Austria, who still held Italian territories ("Unredeemed Italy"); Italy had joined the alliance from pique at France for seizing the coveted Tunis and fear of her interference in behalf of the Pope. That the Alliance was unstable was well proved in the opening years of the World War.

B. **Triple Entente of France, Russia, and Great Britain: 1195, 3529.** Originally a Dual Alliance of Russia and France, it was enlarged to include Great Britain during Edward VII's reign 1089.

**Note:** These Alliances were based on the old principle of the "Balance of Power." France and Russia were balanced against Germany and Austria. Italy joined the latter because of the north African quarrel, while Great Britain, fearing the growing sea-power of Germany, threw its weight on the side of France and Russia.

C. **Germany's Industrial Growth and Need for New Markets: 3905, 1444.**
   a. **William II Backs Economic Ambitions with Militarism: 3738.**
   b. **Effect of Struggle for Colonial Possessions: 837.**

D. **Hague Peace Conference, an Attempt to Combat Militarism: 1559, 2506.**

II. THE NEAR EAST AND THE DISMEMBERMENT OF TURKEY:

A. **Russia Reaches Down Toward the Mediterranean: 3559–60.**
   a. **Crimean War: 922.**
   b. **Russo-Turkish War: 310, 1013.**
   **Note:** The Western Powers rushed to the aid of Turkey not from sympathy with its cause, but to prevent Russia from securing any considerable influence in Constantinople and the Dardanelles.

B. **Balkan Wars Deprive Turkey of Most of Its European Territory: 310, 3560:** Territorial gains of Greece 1526; Serbia 3176; Montenegro 2313; Rumania 3080.

C. **Central Powers Look Toward the Near East:**
   a. **Germany's Balkan Policy and the Bagdad Railroad: 310, 304, 233, 2201.**
   b. **Austria: 310, 3177.** Annexation of Bosnia-Herzegovina: 468, 1196.

III. SCRAMBLE FOR AFRICA:

A. **Modern Explorations Disclose Vast Resources: 38.** Livingstone and Stanley 2033, 3338; Leopold II of Belgium starts the race for Africa 859.

B. **Partition of Africa at Congress of Berlin: 40.**

C. **British Empire in Africa: 513.**
   a. **Occupation of Egypt: 1097.** Control of Suez Canal 3384, 1013; conquest of Anglo-Egyptian Sudan 1093, 1095 (map); "Chinese" Gordon and Kitchener 1489, 1929.
   b. **British Obtain Control of South Africa: 3280–2.** Boer War 446; Cecil Rhodes 3011.

D. **Extension of French Influence:**
   a. **The French in Algeria and Tunis before Congress of Berlin: 97, 3550.**
   b. **Germany Challenges French Rights in Morocco: 2327.**

E. **Italy Obtains Tripoli in War with Turkey: 3541, 1196.**

# World War and Its Consequences

I. CAUSES:

A. **The Spirit of Aggression:** The fundamental cause of the great catastrophe was the aggressive nationalism which had been steadily growing in the great European states. International relations were regarded as essentially competitive and it was only in rare instances, as the International Postal Union (2898), that true coöperation had obtained. As we have seen, in the half century of diplomacy before 1914, national ambitions found an outlet in imperialistic colonial enterprises and a military rivalry that turned Europe into an armed camp.

B. **The Spark that Started the Blaze:** The immediate cause was the crisis raised by the assassination of the heir to the Austrian throne: 3789–90. 1196, 1354, 310.

II. MILITARY EVENTS OF THE WAR:

A. **The Western Front:**
   a. **Germany's Plan to Reach Paris by Striking through Belgium: 3791–2.**
      1. Delay in Belgium and fall of Liége: 1995, 81.
      2. Plan shattered at the Marne by French under Joffre: 2150–1, 1894–5.
      3. Germans "dig in" along the Aisne: 69.
   b. **Dash for Channel Ports to Cut off British Checked at Ypres: 3833–4, 3792, 571.** Fall of Antwerp 153.
   c. **Deadlock of Armies:** For eighteen months the lines remained practically deadlocked; neither side could break through the entrenchments of the enemy 3792.
   d. **Campaigns in 1916: 3794.** French hold position at Verdun 3629; battles along the Somme 3275.
   e. **Events of 1917: 3797.** Germans establish the "Hindenburg Line" 1650-1; lose Vimy Ridge 220.
   f. **United States Enters the War: 3800–4.**
   g. **The Supreme Struggle of 1918: 3904–6.**
      1. Reënforced by troops released in the East, the Germans launch offensive along the Somme towards Amiens: 3275, 117, 220.

2. German advance along the Aisne 69; Cantigny, Château-Thierry, Belleau Woods 638, 699, 380.
3. Allied forces united under Foch 1315; steady gains along the Marne 2151; Saint-Mihiel 3110; Meuse-Argonne victories 193–4, 2207; triumph at Sedan 3171.

h. **Armistice Halts Further Advances: 3806, 3808, 213–4.**

B. Other Campaigns:

a. **Russian Front: 3794.**

1. Russians driven out of East Prussia and Poland by brilliant strategy of Hindenburg and Ludendorff 1650, 2076; Warsaw captured 3673.
2. Revolutionary Government makes peace with Germany: 3798, 3094–6.

b. **War in the Balkans:**

1. Serbia and Montenegro crushed by Central Powers: 3794–5, 3806–7, 2313, 377.
2. Rumania overwhelmed: 3795, 3080, 523.
3. Saloniki Campaign: 2097.

c. **Failure at Dardanelles a Blow to Allied Prestige: 3795, 963.**

d. **Italian Campaign: 3795, 3797–8, 3807, 3539.**

e. **Events in Near East:** In Mesopotamia 3795–6, 3798, 305; In Syria 3798, 3807, 2643, 166.

f. **War in South and East Africa: 3796, 1068, 1069.** Work of Boer Generals Botha and Smuts 475, 3254.

g. **Japan Captures German Territory of Kiaochow: 1870.**

h. **Australian Expedition to New Guinea: 2453.**

III. NAVAL OPERATIONS:

A. **Allies Control the Surface of the Seas: 3796.**

a. **German Ships Captured or Sunk: 1223, 2423.**

b. **Battle of Jutland Confirms Allied Power: 2423, 356.**

c. **Blockade of the Central Powers: 437, 1140.**

B. **German Submarine Campaign, an Attempt to Break the Blockade: 3376–8, 3791.**

a. **Attacks on Neutral Commerce: 3799, 3746–7.**

b. **Allied Defensive Measures:** North Sea Mine Barrage 3518–20, 2528, 2601; Raid on Zeebrugge 520.

IV. HOW THE WAR WAS FOUGHT:

A. **New Development in Military Science: 3790–1.**

a. **Abandonment of Open Field Operations for Trench Warfare:**

1. Long-range guns render strongest fortresses useless: 633–5, 636.
2. The effect of machine guns: 2097–2101.
3. Poison gas 1408; star shells 1266; use of autos 274–5.
4. Tanks meet new needs of trench fighting: 3433.

b. **Importance of Airplanes: 58–60.**

B. Organizing Citizen Armies:

a. **British War Machine: 3792, 3794.**

1. Lloyd George and the Coalition Government: 2040–1.
2. Training of "Kitchener's Mob": 1930.
3. Leaders: Haig 1559; Beatty 355–6.

b. **Canada's Part: 620.** Sir Robert Borden 466; Sir Sam Hughes 1693; General Currie 940.

c. **The Part of Australia 269; India 1754; South Africa 3796, 3254, 475.**

d. **How the United States Mobilized: 3801–4, 3748.**

1. Military leaders: March 2145; Pershing 2732–3; Sims 3243.
2. Establishing the A. E. F. in France: 466, 502, 3110.
3. Civilian Activities: Food Conservation 1680, shipbuilding 3214, 3216, 3218; Red Cross 2984–6.

C. Devastation and Relief Works:

a. **Belgium and Northern France: 376, 1353.**

1. Cities looted and destroyed: Antwerp 152–3; Bruges 520; Liége 1995; Lille 2008; Louvain 2073; Reims 2992–3; Saint-Quentin 3111.
2. Relief Work: Cardinal Mercier 2199; King Albert 81; Hoover and his work 1679.

b. **Suffering in Other Lands:** In Poland 2858; massacres in Armenia 213; looting of Rumania 3080.

V. DIPLOMATIC RELATIONS IN THE WORLD WAR:

A. **Allies Joined by Montenegro 2313; Japan 1870; Italy 3795: Portugal 2890; Rumania 3795, 3080.**

B. **Central Powers Strengthened by Turkey 3560; Bulgaria 533.**

C. **United States Drawn into the Conflict: 3798–3801, 3746–7.** Followed by Brazil 496; China 748; Greece under Venizelos 3625, 1526.

D Overtures of Peace:

a. **Pius X Appeals for Peace at Beginning of War: 2814.**

b. **Wilson Offers Mediation for "Peace without Victory": 3747.**

c. **Benedict XV Suggests Terms to the Belligerents: 382.**

d. **Central Powers Force Peace upon Rumania: 3080.**

e. **Revolutionary Russia Signs Treaty of Brest-Litovsk: 3798, 3575.**

VI. PEACE CONFERENCE AT PARIS:

A. **Attended by Representatives from All Allied and Associated Powers: 3633, 3808.**

a. **Dominated by "Big Four":** Wilson 3748; Lloyd George 2041; Clemenceau 787; Orlando 3808.

b. **Other Influential Delegates:** Borden 467; Smuts 3254; Venizelos 3626.

B. **Treaty of Versailles with Germany: 3808, 3811, 3749, 1196.** Subsidiary Treaties with Austria (St. Germain) 3811–2; Hungary (Trianon) 1703–4; Bulgaria (Neuilly) 533, 3812; Turkey (Sèvres) 3812, 3560.

**Note:** For details concerning the political and territorial changes made by these treaties, see the section on "Results and Peace Settlement" under the World War entry in the Fact-Index.

C. **League of Nations Established: 1974, 3808.**

D. **American Senate Refuses to Ratify the Treaty without Reservations: 3812, 3749.** Separate treaty signed with Austria and Germany: 1582.

**Note:** The United States was not alone in refusing to ratify the treaties signed at the Peace Conference; China refused to sanction the loss of Shantung (3812), and other treaties were disregarded. This situation led to a series of international conflicts and the subsequent modification of much of the work of the Conference (3812).

VII. REVOLUTIONS AND THE NEW NATIONS OF EUROPE:

A. **Russian Revolution: 3092, 3094–6.**
   a. **Abdication of Nicholas II: 2506.**
   b. **The Bolshevists and Their Leaders Lenin and Trotzky: 450, 1986, 3544.**
   c. **Disruption of the Empire: 3084.** Loss of Finland 1248; Loss of Esthonia 1180; Latvia 1969; Lithuania 2030; Russian Poland 2856; Bessarabia 3080; Siberia 3229; Ukraine 3575, 2560. See also in Geography Outline pages 3914, 3921.

B. Dissolution of Austria-Hungary and the Formation of New States:
   a. **Czecho-Slovakia Obtains Independence: 947, 447.**
   b. **Slavs of Austria-Hungary Join Serbia and Montenegro to form Jugo-Slavia: 1901, 468.**
   c. **Austria Stripped of Former Possessions, 269, 3642.**
   d. **Hungary Given Independence: 1703, 524.**

C. **Hohenzollerns Overthrown in Germany: 3808.**
   a. **William II Seeks Refuge in Holland: 3738.**
   b. **Republican Government Established Throughout German Empire: 1444–5, 2929, 347, 3132.**

# UNITED STATES HISTORY

I. PERIOD OF DISCOVERY AND EXPLORATION:

A. The Men who Found the New World:
   a. **Leif Ericsson the Northman: 2526, 2527.**
   b. **Christopher Columbus and His Achievement: 846.**

B. Explorations and Explorers:
   a. Of the Atlantic Coast:
      1. John Cabot visits North America: 561.
      2. Cartier explores the St. Lawrence: 651.
      3. Hudson discovers Hudson River and Hudson Bay: 1690.
      4. Captain John Smith maps northern coast: 3253.
   b. Spanish in the South:
      1. Ponce de Leon in Florida: 2878.
      2. De Soto discovers the Mississippi: 999.
      3. Coronado's search for the mythical cities: 892.
   c. **French in the Interior of North America: 2265.** Champlain 686; Marquette and Joliet 2151, 1900; La Salle 1964; Hennepin 1632.

II. UNDER COLONIAL RULE:

A. Founding of the Thirteen English Colonies:
   a. **Virginia Settled at Jamestown: 1861, 3252–3.** Bacon's Rebellion: 301.
   b. **New York Settled by the Dutch: 2496–7, 80, 2486.** Captured by the British 2497, 3375.
   c. Massachusetts Colony:
      1. Plymouth Colony founded: 2175–8, 2841–2, 3338.
      2. Puritan Migration and Massachusetts Bay Colony: 2170, 3757, 472, 2937; includes Maine 2129.
      3. Witchcraft persecutions: 3774.
   d. **Dutch and Swedes Settle along the Delaware: 989.**
   e. **Maryland Founded: 2163, 139.** Baltimore 322.
   f. **Early Connecticut: 867–9, 1595.** New Haven founded 2456.
   g. **Roger Williams Founds Rhode Island: 3742, 3008–10, 2927.**
   h. **New Jersey under Different Flags: 2461.**
   i. **The Carolinas: 2520–1, 3292, 699.**
   j. **New Hampshire becomes a Separate Colony: 2456.**
   k. **Quaker Colony of William Penn: 2716, 2721–2.**
   l. **Georgia, the Last of the Thirteen Colonies: 1434, 3130.**

B. French and Spanish Settlements:
   a. **French Posts in the Upper Mississippi Valley and the Great Lakes Region: 617.** Detroit 2226, 999; St. Louis 3110; in Illinois 1736; Indiana 1762; Wisconsin 3772.
   b. **French in the Lower Mississippi Valley: 2072.** New Orleans 2471.
   c. **Spanish Cities of St. Augustine, Santa Fe, and Albuquerque: 3106, 2466.**

C. **Beginnings of Democracy in the Thirteen Colonies:**
  a. **Political Foundations:**
    1. The meeting of the Virginia House of Burgesses in 1619 was the first legislative assembly held in America.
    2. Mayflower Compact, the first written agreement establishing a government by the governed: 2176.
    3. Direct democratic government in the towns: 3521, 3008–9. The most liberal of the colonial charters based suffrage upon a property qualification 3009; voting was in most cases by acclamation 321.
    4. In the South the county was the local government unit: 3521.
    5. Connecticut frames the first written constitution: 868.
  b. **Liberty in Matters of Religion:**
    1. Rhode Island was the first colony to grant religious freedom: 3742.
    2. Maryland soon followed: 2163; gradually the restrictions were removed in other colonies.

D. **French and Indian War Ends the Struggle for the Mississippi Region: 1362, 3180–1.**
  a. **Attitude of the Indians: 1772, 2486.**
  b. **Braddock's Defeat: 3676.**
  c. **Capture of Louisburg: 2538.**
  d. **Montcalm and Wolfe at Quebec: 2312, 3775, 2949.**

E. **Movements Toward Unity: 3592, 3602.**
  a. **New England Confederation Formed against the Indians: 3757.** Indian uprisings against the colonists 1772, 3332.
  b. **Albany Congress and Franklin's Plan of Union: 80.**
  c. **Stamp Act Congress: 3337, 2604.**
  d. **Obstacles to Unity:** Lack of good communications and differences in the social and economic life of the northern and southern colonies.

**Note:** For details concerning the general social conditions in the colonies, consult the "Colonial Period" section under "United States History" in the Fact-Index.

III. REVOLUTIONARY WAR:

A. **Causes of the War: 3000–2.**
  a. **British Policy which Roused Colonists' Ire:**
    1. Tories support George III's attempt to exercise "Divine Right of Kings": 2869, 1428, 1430.
    2. Opposed by Whig Party under leadership of Chatham and Burke: 2869, 700, 540.
  b. **The Effect of the Stamp Act: 3337–8.** Stamp Act Congress: 3592.
  c. **First Cont nental Congress Protests against Coercive Acts: 3593.**
  d. **Colonial Leaders Opposed to Crown Policies:** Samuel Adams 16; Patrick Henry 1637; James Otis 2604 John Hancock 1570.
  e. **Many Loyalists Support the Royalist Cause: 617, 2583.**

B. **Beginnings of Open Warfare:**
  a. **Lexington and Concord: 1990.** Paul Revere's famous ride 2999–3000.
  b. **Battle of Bunker Hill: 533–4.** Israel Putnam, the American Cincinnatus 2939.

C. **Independence Declared: 975–6, 3002–3.**
  a. **Paine's Appeal for Independence: 2626.**
  b. **Work of Richard Lee 1982; John Adams 13.**

D. **Military Events of the War:**
  a. **George Washington, Commander-in-chief of the Colonial Forces: 3676.**
  b. **Battle of Saratoga, the Turning Point of the War: 3003, 3126, 1408.**
  c. **Winter at Valley Forge, the Low Ebb for Washington's Army: 3615, 3003.** Baron Steuben trains the troops: 3355.
  d. **George Rogers Clark Wins the Old Northwest for the Colonies: 783.**
  e. **Exploits of Famous Men:** Ethan Allen 98; Horatio Gates 1408–9; Nathanael Greene 1539; Nathan Hale 1565; Francis Marion 2149; Anthony Wayne 3706–7; John Paul Jones 1900–1. The tragedy of Arnold 219, 123.
  f. **Gallant Foreigners who Aided the Colonists:** DeKalb 987; Kosciusko 1944; Lafayette 1956; Pulaski 2933; Rochambeau 3033; Steuben 3355.

E. **French Treaty of Alliance: 3003, 1956, 1367.** Franklin's work at the French Court 1358.

F. **Government During the War:**
  a. **Second Continental Congress: 3593.**
  b. **Finances Managed by Robert Morris: 2328.**

G. **Treaty of Peace: 3004, 3602, 3633.** Negotiated by Franklin 1358, Adams 13, and Jay 1880.

IV. CRITICAL PERIOD OF AMERICAN HISTORY: **3602.**

A. **Government under the Articles of Confederation:**
  a. **Weakness of the Government: 3593, 3347.**
    1. The Articles of Confederation "established not so much a form of government as a method of diplomatic intercourse."
    2. Unsettled political and financial conditions cause unrest; Shays' Rebellion 3197.
  b. **Northwest Territory Organized: 2528–9, 1882.**

B. **Formation of the Constitution: 3593–4.**
   a. **Personnel of the Constitutional Convention: 3593.** Influence of Washington 3677; Madison, the "Father of the Constitution" 2107.
   b. **Form of Government Provided by the New Constitution: 3593, 3595.**
      1. Legislative Department: 860–2.
      2. Executive Department—President and Vice-president: 2913–4, 3636–7.
      3. Judiciary: 909.

   **Note:** For details regarding the provisions and interpretation of the Constitution consult the entry "United States Constitution" in the Fact-Index.
   c. **Fight over Ratification:**
      1. Campaign for adoption led by Hamilton, Jay, and Madison through "The Federalist": 1568, 1880, 2107. Importance of Hancock in Massachusetts 1571; Marshall in Virginia 2155.
      2. Opposed by Patrick Henry, Lee, and Monroe in Virginia: 1638, 1982, 2306; by Samuel Adams in Massachusetts: 16.
      3. Adoption of first ten amendments removes much objection: 3594, 393, 2918.

V. NATIONAL BEGINNINGS:
A. **Period of Federalist Influence: 3602, 3604.**
   a. **Organization of Federal Government under Washington's Guidance: 3677–8.** How the Cabinet came into existence: 555.
   b. **Sound Financial Policy Initiated by Hamilton: 3677, 1569.**
   c. **Rise of Opposing Political Parties—Federalists and Democratic Republicans: 3677, 2870.** Led by Jefferson and Hamilton: 1882.
   d. **Jay Treaty Adjusts Difficulties with Great Britain: 1880, 2227.**
   e. **Adams' Administration and Downfall of the Federalist Party: 13–14.**
      1. X Y Z Affair with France: 3826.
      2. Alien and Sedition Laws passed by Federalists rouse much opposition: 3347, 14.
      3. Appointment of John Marshall to Supreme Court—importance in development of Federal Government: 2155.

B. **Triumph of Democratic Republicans:**
   a. **Election of Jefferson to Presidency: 1882–3.** Twelfth Amendment enacted to prevent repetition of contest in Congress 3637.
   b. **Jeffersonian Ideas of Democracy: 1883, 3604.**
   c. **Louisiana Purchase Opens up Vast Possibilities of Expansion: 2072–3.** Lewis and Clark 1989.
   d. **Harrison and the Indians in the Northwest: 1594, 3451–2.**

C. **War of 1812: 3670, 3604, 2108.**
   a. **Causes of the War 3570–1.**
      1. Disputes with Great Britain and France over neutral trade lead to Embargo Acts: 1883, 1140.
      2. "War Hawks" demand war with Great Britain: 3671, 785, 575.
   b. **Brilliant Naval Duels: 3672, 2423.** Decatur 971; Lawrence 1972–3; Perry 2730.
   c. **Land Campaigns: 3672.** Harrison in the Northwest 1594; Jackson in the South 1856, 73.
   d. **Opposition in New England: 3672–3, 3347, 3604, 2108, 521.**
   e. **Growth of a National Spirit: 3673, 3604.**

D **The Period of Transition from 1815 to 1829.**
   a. **New Social and Economic Conditions:** The War of 1812 was followed by a readjustment of interests throughout the country. Under the guidance of John Marshall the national character of the government was strengthened by a broad construction of the Constitution 2155. With the decline of the ship trade in New England, commercial fortunes were devoted to manufacturing 3007, 3008; mill towns sprang up along the rivers 2075, 1973, 2449; agitation began for a tariff to protect the new industries. The invention of the cotton gin opened a new era in the South 3735-6; large scale production of cotton became profitable; with it came a revival of slave labor and the spread of the plantation system. At the same time the South became increasingly dependent upon imported manufactured goods, and therefore favored low tariffs 575, 776. To the West the problem of transportation was all-important, for its prosperity depended upon the construction of roads and canals for shipping its grain and live stock 627, 3024; here the demand for cheap tools and cloth was tempered by the desire for the protection of agricultural produce. From these mixed motives Clay evolved his famous "American System" which was to protect the Eastern manufacturers and supply funds for extensive internal improvements 785.
   b. **Era of Good Feeling: 2306–7.**
      1. Missouri Compromise, the first national crisis on the slavery issue: 2273, 786.
      2. Expansion of territory, Florida purchased: 1295.
      3. Monroe Doctrine formulated—the basis of American foreign policy: 2307, 2305.
   c. **Administration of John Quincy Adams: 15.** Beginnings of Whig and Democratic Parties. 2870; the tariff question 575.

E. **Jacksonian Epoch and Western Expansion: 3604, 1856.**
   a. **Jackson and the Nullification Principle:** Rise of the nullification theory 3347–8; Webster-Hayne Debate 3710; Tariff of Abominations nullified by South Carolina 3348, 575; Force Bill and Compromise Tariff 1857, 3711, 786.

b. **Financial Policy and War upon National Bank: 1856–7.** Continued by Van Buren 3616.
c. **Indian Affairs:** Trouble over Indian removals from Georgia 1857; Seminole War in Florida 3617, 1773; tribes settled in "Indian Territory" 2576.

F. **Rounding Out National Boundaries: 3604, 3605 (map).**
a. **Texas Annexed: 3571, 2872.** Houston and Austin help Texas secure independence 3478, 261, 1688; David Crockett 922.
b. **Oregon Country Acquired: 2872.**
c. **Southwestern Territory Ceded by Mexico: 2208.**
d. **Gadsden Purchase: 2802.**

G. **Foreign Relations:**
a. **Webster-Ashburton Treaty Settles Northeast Boundary Dispute: 3571, 2129.**
b. **Northwestern Boundary Question Settled by Treaty: 2872.**
c. **War with Mexico: 2207, 2872.**
1. Services of Generals Scott and Taylor: 3153, 3444.
2. Americans seize California: 580–1.
d. **Clayton-Bulwer Treaty Regarding Proposed Isthmian Canal: 3444, 2653.**

H. **New Social Conditions:**
a. **New Era in American Political Methods Ushered in by "Log Cabin" Campaign: 1594.**
1. Jackson had already introduced the "Hero on Horseback" and shown what a powerful party influence the Spoils System could be: 1856.
2. It was at this time that the convention system became established: 2870.
b. **Influx of Foreign Immigrants: 1738, 1810, 3771, 3772, 766.** Opposition of Know-Nothings: 2871.
c. **Rapid Development of Western Prairies Due to Improved Farm Machinery and Transportation: 44, 2095.**
1. Steamboating on the Ohio and Mississippi: 2268.
2. The thirty years preceding the Civil War saw a tremendous activity in railroad building. Beginning in 1830 with a few miles of track, 2302 miles had been built by 1840. In the next decade 5043 more miles were added and, largely owing to the government land grant policy (1960), 21,424 miles were in existence in the fifties: 1960.
3. Gold Rush to California hastens development of West: 581, 582, 650.
d. **Moral and Intellectual Movements:**
1. Golden Age of American Literature: 112–4.
2. Temperance and Prohibition Movements gain strength: 3465, 2920.
3. Beginning of the movement for women's rights: 3778.

VI. SLAVERY BECOMES THE GREAT ISSUE:

A. **Rise of the Abolition Movement: 473, 2572, 3391–2.**
a. **William Lloyd Garrison Founds the 'Liberator': 1400–1.**
b. **Anti-Slavery Movement in Congress:** Adams' fight against "gag rule" 15–16; Benton's stand 384; Seward 3182; Sumner 3391.
c. **Literature of the Movement: 112–3, 3249.** Whittier 3736; Greeley 1538; 'Uncle Tom's Cabin' 3368.

B. **Southern Desire for More Slave Territory: 2802, 855.** Calhoun's position 576.

C. **Rapid Territorial Expansion Makes Question Acute: 2872, 855.**
a. **Annexation of Texas: 3571.**
b. **Oregon Territory Secured: 2598, 3688.**
c. **Cessions of Mexico after Mexican War: 2207, 2208.**

D. **The Approach of the Crisis:**
a. **Compromise of 1850: 855–6, 1240.**
b. **Kansas-Nebraska Bill and Struggle for Kansas: 1913.** Douglas' Doctrine of Squatter Sovereignty 1027, 2017.
c. **Republican Party Founded on Anti-Slavery Principles: 2870, 3772, 2012, 435.**
d. **Dred Scott Decision: 1039, 522.** Lemmon Case in New York 222.
e. **Lincoln-Douglas Debates: 2017, 1027.**
f. **John Brown's Raid: 516.**

E. **Election of Lincoln to Presidency: 2012, 3182, 435.** Early life and political career: 2011–12.

VII. THE CIVIL WAR: **776.**

A. **Preliminary Events:**
a. **The Secession Movement:**
1. Growth of States' Rights and Secessionist doctrines: 3347–8.
2. South Carolina and six other states secede and form a Confederacy: 857, 777.
3. Weakness of Buchanan's position: 522–3.
b. **Fall of Fort Sumter and Lincoln's Call for Troops: 1332, 2014, 777–8.**
c. **Indecision of the Border States:** Maryland 2164, 322; Kentucky 1920; Missouri 2273; separation of West Virginia 3723.

B. **Comparative Resources of North and South: 778.**
a. **Northern Leaders:** Lincoln 2014, Seward 3182, and Stanton 3339 in the administration: Grant in the field 1498; Adams abroad 12.

b. **Southern Leaders:** Lee and Stonewall Jackson 1982, 1858; Jefferson Davis and Alexander H. Stephens 967, 3353.

C. **Progress of the War:**

a. **Opening Events:**

1. Battle of Bull Run: 533, 778.
2. Trent Affair with Great Britain: 3539.

b. **Campaign of 1862 in the West:**

1. Opening of the Upper Mississippi—Forts Henry and Donelson 1498, 779; Shiloh 3206–7, 3205, 1498.
2. Opening of the Lower Mississippi—New Orleans: 1225, 2884.

c. **Campaign of 1862 in the East:**

1. McClellan and the Peninsular Campaign: 2095, 778.
2. Lee's attempts to carry war into North: Antietam 149–50; Fredericksburg 1361, 1571.

d. **Emancipation Proclamation: 1139–40, 778, 2014.**

e. **The Crisis of 1863:**

1. Lee's second failure to carry the campaign North: Chancellorsville 687, 1858; Gettysburg 1453, 2179, 1571.
2. Fall of Vicksburg opens all of the Mississippi: 3637, 2884.
3. Control of Eastern Tennessee: battles of Chickamauga 3490, 700; Chattanooga 700–1, 1498.

f. **Naval War:**

1. Southern ports blockaded: 437, 968; effect in England 12.
2. Fight between the 'Monitor' and the 'Merrimac': 2286.
3. Career of the 'Alabama': 73, 12.
4. Farragut captures Mobile Bay: 1225.

g. **The Campaign of 1864.**

1. Grant's operations against Richmond: 1984, 1498, 3019.
2. Sheridan in the Shenandoah Valley: 3204–5.
3. Sherman's march to the sea: 254, 3205–6.
4. Thomas defeats Hood in the west: 3490, 2398.

h. **Surrender at Appomattox: 1498–9, 1984, 779, 781** (picture).

VIII. **RECONSTRUCTION PERIOD: 3605.**

A. **Problems of Reconstruction: 780.**

a. **Quarrels between Johnson and Congress: 1897–8.**
b. **The Question of the Freed Negroes: 2434.**
c. **Hayes Withdraws Troops from the South: 1611.**

B. **Other National Questions Following the War:**

a. **Financial Readjustment: 3605–6.** Resumption of specie payments and the currency question 1499.
b. **Era of Political Corruption: 1499.**
c. **Hayes-Tilden Election Dispute: 1610–11, 2072.**

IX. **A PERIOD OF TRANSITION:** For details of foreign relations during this and later periods, see section of "Foreign Policy" at the end of the United States Outline.

A. **Civil Service Reform:**

a. **Hayes Tries to Mitigate Evils of Spoils System: 1611.**
b. **Civil Service Commission Established: 222–3, 776.** Influence of Garfield's assassination 1399.
c. **Later Civil Service Reforms:** Cleveland 790, Roosevelt 3059.

B. **Economic Reform:**

a. **Tariff Issue:** Contests during Cleveland and Harrison's administrations 790, 1593, 2103; Dingley Bill reinstates high duties 2104.

b. **Currency Reform: 3605–6.**

1. Greenback Party formed by people who believed that the generous issue of paper money would have avoided the panic of 1873 and have restored prosperity 2871; movement died out with the resumption of specie payments.
2. Beginning of the Free Silver Movement—"Crime of 1873" and Bland-Allison Act: 1499, 1611.
3. Sherman Silver Purchase Act: 1592, 791.
4. Bryan-McKinley Campaign on "16-to-1" issue: 520, 2104.
5. Gold standard adopted: 2104.

c. **War against Trusts:**

1. Growth of "Big Business": 3545–6.
2. Beginning of anti-trust legislation: Interstate Commerce Commission established 1794; Sherman Anti-trust Law 1592.

d. **Growing Importance of Organized Labor: 1947, 1487.**

X. **INTERNAL AFFAIRS OF THE TWENTIETH CENTURY:**

A. **Roosevelt Inaugurates an Era of Reform: 3059–63.**

a. **Conservation of Natural Resources Begun: 869–70, 3060, 3062.**
b. **Stricter Regulation of Private Business: 3060.**

1. Anti-Trust Law enforced: 3546.
2. "Pure Food" laws passed: 2936–7.

c. **Progress of the Labor Movement: 3060.**
1. Roosevelt intervenes in the Anthracite Coal Strike: 172–3.
2. Department of Commerce and Labor Established: 3600.

B. **Taft Administration: 3428–9.**
a. **Continuation of Rooseveltian Policies:**
1. Postal Savings Bank and Parcels Post: 2894, 329.
2. Separate Department of Labor: 3428, 3600.
b. **High Tariff Enacted: 3437.**
c. **Progressive Movement Splits Republican Party: 3429, 2870, 3062.**

C. **Democracy under Wilsonian Leadership. 3744–9.**
**—Continuation of Economic Reform:**
1. Tariff Revised Downward: 3437.
2. Banking and Finance: Federal Reserve Banking Law 1230; Farm Loan Board 1224; Federal Income Tax 3441.
3. Regulation of Trusts: Federal Trade Commission established 1230; Clayton Act 3546.
4. Labor Problem: Adamson Law 3747; Seamen's Act 3219.

**Note:** For the events connected with the World War see the Outline on the World War.

D. **Changes in Social and Political Life:**
a. **Increase in the Popular Control of Government:**
1. Direct Primary Elections: 2915.
2. Use of Initiative, Referendum, and Recall: 1778–9.
3. Direct election of United States Senators: 3428.
4. Suffrage extended to women: 3778.
b. **Public Welfare Now a Governmental Problem:**
1. More equitable distribution of taxes—income and inheritance taxes: 3441, 3428.
2. Nation-wide prohibition adopted: 2920–1.
3. Immigration restricted: 1738.
4. Widening scope of National Government's Activities: 3593—Vocational education 3655–6; Federal Road Act 3026; Pure Food and Drugs Act 2936–7; Public Health Service 1612.

E. **Republicans under Harding Take Up Problems of After-war Adjustment: 1582.** Charles Evans Hughes 1693; Budget System in national finance 3598.

XI. **FOREIGN POLICY AND GROWTH OF A COLONIAL EMPIRE:**

A. **Settlement of Fishery Disputes with Great Britain:**
a. **Newfoundland Fisheries (Atlantic Fisheries Dispute): 172.** The question of the rights of American fishermen was a constant source of friction 2450: after the failure of a century of treaties to settle the matter, it was arbitrated at The Hague.
b. **Bering Sea Seal Fisheries: 3168, 1593.**

B. **Beginning of our Pacific Island Interests:**
a. **United States Shares in the Division of the Samoan Islands: 3120, 1592**
b. **Annexation of Hawaii: 1605, 2104, 791.**

C. **The Development of the Monroe Doctrine Since the Civil War: 2307.**
a. **France Forced to Withdraw from Mexico: 1898, 2216.**
b. **Arbitration of British-Venezuelan Boundary Dispute: 3622–3, 791, 172.**
c. **German-Venezuelan Controversy Arbitrated: 3623, 3062.**
d. **Intervention in Santo Domingo and Haiti:** Roosevelt assumes charge of Santo Domingan customs 3125, 3062: Wilson continues policy in Haiti 1560.
e. **Present Attitude Toward the Monroe Doctrine:** Hostility of South America softened by Pan-American Movement 2307, 3289, 435; Monroe Doctrine recognized by League of Nations 1974.

D. **The Spanish-American War: 3306–7, 2104, 938, 1000–1.**
a. **Increase Overseas Possessions:** Guam 1545; Philippine Islands 2770, Porto Rico 2887.
b. **Problem of Governing these Dependencies:** In the Philippines 3428, 2770; in Porto Rico 2887; extension of self-government 3601.
c. **Protectorate Over Cuba: 938.**

E. **The Panama Canal and the Caribbean Policy: 644, 3606.**
a. **Building of the Panama Canal: 2651–63.** Goethals and Gorgas 1477, 1490.
1. How Roosevelt obtained the Canal Zone: 2648–9, 3062.
2. Treaty agreements with Great Britain: Clayton-Bulwer Treaty 3444, 2653; Hay-Pauncefote Treaty, which provided that the Canal be open to all Nations on equal terms, and the Tolls Act 3746.
b. **General Principles of the Caribbean Policy:** Establishing of protectorates in Cuba and Haiti 938, 1560; supervision of depleted finances as in the case of Santo Domingo and Nicaragua 3125, 3062, 2504; control of possible canal routes 2505; possession of strategic positions such as the Virgin Islands and Nicaraguan naval bases 3651, 2505.

F. **Recent Relations with Mexico: 2216–8, 3746.**

G. **Far Eastern Affairs.**
a. **China:** American participation in Boxer troubles 748, 2104; "Open Door" policy secured 3606; Wilson abandons "dollar diplomacy" 3746.

b. Japan: Commodore Perry opens country to Western Civilizations 1240, 3830; difficulties arising from Japanese immigration 1870; mediation in Russo-Japanese War 3098, 3062; question of the mandate over Yap 1582.

H. American Contributions to International Peace Movement:
   a. Policy of International Arbitration: **172, 521.**
   b. Reciprocity Movement: **1971, 466, 435.**
   c. Relation to the League of Nations: **1974, 3812, 3429.**

I. United States and the World War: **3746–9, 3798–3812, 1679–80.** For details of the American part in the war see the Outline on the World War.

# CANADIAN HISTORY

I. EXPLORATION AND EARLY SETTLEMENT UNDER THE FRENCH: **616–7.**
   A. The Men Who First Visited Canadian Shores·
      a. The Northmen: **2526.**
      b. The Discoveries of John Cabot: **561–2, 2450.**
      c. Cartier Sails up the St. Lawrence: **651–2.**
      d. Henry Hudson Charts the Hudson Bay Region: **1690.**
   B. Beginnings of Settlement:
      a. First French Settlement at Port Royal: **2538.**
      b. Champlain Founds Quebec: **686–7.**
      c. Founding of Montreal: **2317.**
      d. Administration of Count Frontenac: **1375.**
   C. Extension into the Interior: Marquette and Joliet 2151, 1900; La Salle 1964–5; Father Hennepin 1632.

II. CONFLICT OF FRENCH AND BRITISH:
   A. British Claims to Canada:
      a. Nova Scotia and Newfoundland: **4, 2450.**
      b. Hudson Bay Region: **1690.**
   B. Hudson's Bay Company, a Rival to French Fur-Trading Interests: **1692, 1389.**
   C. Wars over Colonial Territory:
      a. King William's War: British capture Acadia and attack Quebec, but restore conquests in treaty of peace.
      b. Queen Anne's War: Results in cession of Hudson Bay Region, Newfoundland, and Acadia to the British; French fishing rights secured 2450.
      c. King George's War: Conquests restored at Peace.
      d. French and Indian War Ends French Rule in Canada: **1362, 2538.** Deportation of Acadians 4; Wolfe and Montcalm at Quebec 3775, 2312, 2949.

III. A CENTURY OF BRITISH RULE:
   A. Loyalists Immigrating from the Thirteen Colonies Bring Democratic Ideas of Government: **2449, 2538, 2583.**
   B. Development of Self-Government: **617–8.**
      a. Rebellion of 1837 against Officialdom: Papineau leads French in Lower Canada 2673, 2947; Mackenzie in Upper Canada 2102.
      b. Union of Upper and Lower Canada with a Responsible Government: **307.** The Act of Union was passed by the British Parliament upon the recommendations of Lord Durham. When he returned to England following a brief term in Canada as Governor-General, Durham sent to the Colonial Office a famous report upon the affairs in British North America, which is one of the greatest of the British state papers. The policies of government for colonial possessions there outlined have become the basis of Britain's tremendously successful system of imperial government.
      c. Establishing of a Dominion Government: **2096, 3553.**
   C. Westward Expansion:
      a. Mackenzie's Explorations: **2102.**
      b. Hudson's Bay Company and the Fur Trade: **1692, 1333.**
      c. Lord Selkirk's Colony and Manitoba: **3752, 2137.**
   D. Relations with the United States:
      a. War of 1812: **3670–3.**
      b. Great Lakes Neutralized: **1514.**
      c. Settlement of the Maine Boundary Dispute: **3617, 2129.**

IV. UNDER DOMINION GOVERNMENT:
   A. Territorial Expansion: **618.**
      a. Purchase of Territory of Hudson's Bay Company: **2528, 1692.**
      b. Organization of Manitoba Precipitates Red River Rebellion: **2137, 2986, 3369.**
      c. British Columbia Joins the Federation: **513.**
      d. Building of the Canadian Pacific Railroad Opens Western Prairies to Settlement: **513, 3369, 2096.**
      e. Yukon Organized: **3836.**
   B. Political Events: **618, 620.**
      a. Sir John A. Macdonald Leads the Conservatives: **2096.** Riel Rebellion **3129.**

b. Liberal Administrations under Sir Wilfrid Laurier: **1971.**
c. Return of Conservatives to Power under Sir Robert Borden: **466-7.**
d. Suffrage Extended to Women: **3779.**

C. Imperial Relations: **513-4.**
a. Participation in the Boer War: **3369, 1693.**
b. Canada's Part in the World War: **620, 466-7.** Contest over Conscription 1971, 2947; for further information concerning Canadian participation in the war see the Outline on the World War.
c. Place in the League of Nations: **467.**

# Picture Aids for the History Student

## ANCIENT HISTORY

An Exciting Moment in Prehistoric Times 2132.
Some Types of Prehistoric Men 2133.
The First Artists of the Human Race at Work 666.
In the "Wild and Woolly" Days of Long Ago 667.
Examples of the Caveman's Art 668.
How Man Made Himself Master of the Brute World 669.
The Picture Story of Civilization 772-4.
Mute Memorials of the Rocky Path Our Forefathers Traveled 3361.
The Art of the Stone Age People 2628.
Relics of the Bronze Age 515.
The Key to the Story of Ancient Egypt 1099.
The Building of the Great Pyramid 2939.
Three Tombs the Pharaohs Built 2940.
How Egyptian Bricks Were Molded 503.
Pharaoh on His Way to the Temple 1101.
Rameses the Great Out for a Drive 1103.
The Statue that Used to Sing 1105.
The Great Hall of Karnak 1105.
Egyptian Wall Painting More than 3000 Years Old 2629.
Rameses II, King of Egypt 1106.
The Beautiful Ruins of Philae 1106.
The Royal Residence of an Assyrian King 295.
How Assurbanipal Slew the Lions 296.
Assyrian Soldiers of the Empire 296.
The Babylonian Story of the Flood 297.
The Mighty Phalanx on the March 297.
Where Assyria Spread Her Empire 298.
Pharaoh's Daughter and the Infant Moses 2333.
Moses Bringing Down the Tablets from Mount Sinai 1889.
Scroll of the Jewish Laws 1889.
The Sacred Trumpet of the Jews 1890.
Esther Pleading for Her People 1181.
The Triumph of a Great Jewish Heroine 1892.
A Group from the Famous "Frieze of the Prophets," 2923.
A Hebrew Scholar Reading from a Scroll 389.
The Road into the Land of Canaan 2647.
And Ruth Said, "Entreat Me Not to Leave Thee" 3101.
The Famous Behistun Rock 2739.
Where European Civilization was Born 27.
Aegean Art 1000 Years before Christ 28.
The Wooden Horse Entering Troy 3544.
"A Reading from Homer" 3542.
The Ostracism of Aristides the Just 1519.
Pericles, Glorious Leader of Athens 2729.
The Young Alcibiades Learns Wisdom from Socrates 3271
A Golden Day in Golden Greece 1516.
Acropolis at Athens 1517.
The Glorious Acropolis in the Days of Pericles 11.
Greek Children at Play 1521.
A Young Athlete in the Making 1523.
Ruins that Recall the Glorious Past of Athens 250.
Figures from the Frieze of the Parthenon 248.
Young Aristotle in the Market-Place 195.
How the Thebans Broke the Power of Sparta 3485.
Demosthenes, the Master Orator 993.
Diogenes and That Lantern Trick 1012.
Alexander the Great, World Conqueror 86.
Alexander and the Gordian Knot 86.
The Family of Darius at the Feet of Alexander 2737.
Alexandria in the Days of Its Glory 87.
"Don't Disturb My Circles!" says Archimedes 175.
When Horatius Saved Rome 3495.
The Romans Defy the Conquering Pyrrhus 3047.
When Hannibal Crossed the Alps 1577.
Cicero Denouncing Cataline Before the Roman Senate 765.
The Famous Pompey's Pillar 88.
Julius Caesar, Soldier, Scholar, Statesman 563.
The Surrender of Vercingetorix 564.
Calpurnia Warns Caesar of His Death 565.
Augustus Caesar, Emperor of Rome 257.
Heroic Figures in the History of Rome 3043.
At the Center of Rome's Literary Circle 3041.
When Rome was Mistress of the World 3042.
Splendors of Rome, Ancient and Modern 3051.
The Ancient and the Modern City in Panorama 3055.
The Appian Way 3049.
The Forum of Rome, Then and Now 3053.
The Baths of Caracalla 3057.
Sandaled Feet of the Roman 3221.
Vestal Virgins Learning Their Sacred Duties 3634.
The Last Fight of the Gladiators 1467.
A View of the Ruins of Pompeii 2875.
A Pompeian Matron Spends an Afternoon at Home 2876.
The Cheerful Homes of Those Old Days 2877.
Justinian's Great Byzantine Church 182.
The Seven Wonders of the Ancient World 3179.

## MEDIEVAL HISTORY

Twenty Centuries of Men in Armor 215.
A Typical Medieval Castle 655.
Two Famous Medieval Strongholds 656.
Carnarvon Castle in Wales 3665.
Hunting with the Falcon in England 1220.
A Vassal "Doing Homage" in Feudal Days 1236.
One of the Old Gild Houses 1459.
Shopping in the Days of the Gilds 1459.
Equipping the Young Knight for Adventure 1934.
Picture Story of the Monks 2298-2302.
A Relic of the Middle Ages 3221.
The Huns Charging into Battle 1704.
Charlemagne Holding Court 689.
Where the Dead Emperor Sat for Three Hundred Years 1.
Ancient Travelers of Old British Roads 1151.
A Shoe of Saxon Days 3222.
King Alfred and the Burning Cakes 91.
A Trial in the Days of King Alfred 1904.
The Venerable Bede 387.
When the Northmen Went to War 2526.
The Northmen Who Founded the Russian Empire 2527.
The King Who Built the Great Abbey 1087.
William I, Norman Conqueror of England 3739.
The Grant of London's Charter 3740.
The Emperor Humbles Himself Before the Pope 1632.
Mohammed's Triumphant Return to Mecca 2277.
St. Bernard Rouses Western Europe to Crusading Zeal 931.
Richard's First View of the Holy Land 3017.
Richard the Lion Hearted Assaults Joppa 930.
Louis "the Saint" Honored by His Foes 2064.
A Memorial of Moorish Rule in Spain 3298.
The Triumph of the Longbow at Crécy 1699.
King Henry's Prayer Before the Battle of Agincourt 1635.
An Early 15th Century Shoe, with Stirrup and Spur 3220.
Joan of Arc Receiving the Sword of St. Michael 1893.
How the Maiden Warrior Entered Orleans 1701.
Joan of Arc at the Coronation of Charles VII 695.
In Memory of France's Heroine 1343.

## MODERN HISTORY

The Age of the Reformation and the Renaissance 2988.
Five Dramatic Moments in Spanish History 3301.
How Columbus Convinced a Doubting World 847.
The Strange People from the New World 848.
Balboa's First View of the Pacific 2617.
Savonarola, Reformer of Florence 3130.
When Luther Burned the Pope's Bull 2084.
Charles V—at Twenty He Rules Half the World 690.
Henry VIII, England's Royal Bluebeard 1636.
Sir Thomas More in the Tower of London 2326.
Gaspard de Coligny, Huguenot Leader of France 826.

Queen Mary's Farewell to France 2159.
Sir Francis Drake Finishing the Game of Bowls 210.
When Drake First Saw the Pacific 1030.
The King Who Lost Spain's Power 2763.
Henry IV, King of France and Navarre 1637.
When Sir Walter Spread His Coat 1137.
Raleigh is Charmed by the 'Faerie Queene' 2975.
Shakespeare Reading 'Macbeth' Before Queen Elizabeth 3188.
Captain John Smith Battles the Turk 3253.
The Iron Cardinal at the Siege of La Rochelle 3018.
Gustavus Adolphus Before His Last Battle 1553.
Charles I Taking a Holiday Trip on the Thames 692.
How Cromwell Solved a Legal Difficulty 925.
The Lord Protector and His Daring Admiral 1153.
Charles II Comes into His Own at Last 693.
The "Grand Monarch" of France 2066.
The "Lion of the North" 698.
Peter the Great, Maker of Russia 2745.
Peter the Great's "Window Toward the West" 3093.
A Modern Landlord Would Have Thrown Peter Out 2746.
Within the Walls of the Historic Kremlin 2332.
"The Cossacks are Coming" 2857.
Frederick the Great, the "Iron King" 1360.
Prussia's Growth Through Five Centuries 2929.
The Man Who Won India for England 796.
Horatio Nelson, Hero of the Sea 2435.
William Pitt, Prime Minister at Twenty-four 2812.
Storming the Bastille 1366.
The Aristocrats and the Mob in the Streets of Paris 1369.
The Royal Prisoners in the Temple 1367.
"The Lost Dauphin" of France 2067.
Rouget de Lisle Singing the 'Marseillaise' 2404.
The Strange Boy in the Military School 2392.
The Marriage of Napoleon and Marie Louise 2393.
The Retreat from Moscow 2394.
"Where is the Man Who Would Shoot His Emperor?" 2395.
The Fallen Emperor on His "Rock" 2396.
Wellington, the Conqueror of Napoleon 3717.
The Last of the Bourbons 696.
The Liberator of Italy at a Conference with the Hero King 1837.
The Charge of the Cuirassiers in the Franco-Prussian War 1352.
Chinese Gordon, One of England's Warrior Heroes 1489.
Queen Victoria, on Britain's Throne for Sixty-four Years 3639.
Gladstone the "Grand Old Man" of British Politics 1468.
The Shot that Saved Livingstone's Life 2033.
The Last Sad Journey to the Sea 2034.
Stanley, the Great African Explorer 3339.
Where a Czar was Killed 3092.
Cecil Rhodes, "A Builder of Empire" 3011.
The Peace Palace at the Hague 1558.
Jan Smuts, Boer Soldier 3254.
His Holiness, Pope Benedict XV 383.
William II, Last Emperor of Germany 3738.
George V and Queen Mary of England 1429.
Sir Douglas Haig, Leader of England's Armies in the World War 1559.
"Papa" Joffre, the Hero of the Marne 1895.
The First Battle of the Marne 2150.
Albert I, King of the Belgians, and His Consort 81.
David Lloyd George, Britain's Great Minister 2040.
Verdun—"They Shall Not Pass!" 3629.
The War Hero of France, General Foch 1315.
Georges Clemenceau, "The Tiger" 787.
Halt! Road Torn Up by Shell Fire in Path of Advancing Battery 3789.
Ready for the Onslaught 3790.
French Infantry in a Trench 3791.
The Tricolor Once More Floats Over Alsace-Lorraine 104.
When the Guns of the World War Ceased to Roar 213.
Escorting Merchant Ships Through the "U-Boat Zone" 3792.
"The Enemy Must Not Get the Guns" 3793.
A Fleet of Steel Forts on Wheels Charging Through "No Man's Land" 3794–5.
The Finish of a Submarine 3796.
Learning What to Do in a Gas Attack 3797.
Sure Death to the Advancing Foe 3798.
Sand-Shoes for Soldiers 3799.
Everybody Knows "Hommes 40, Chevaux 8" 3800.
At Château-Thierry, Where the Germans were Finally Stopped 3801.
St. Mihiel Salient, Where the Americans Won Their First Important Offensive 3802–3.
Americans in the Enemies' Trenches 3804.
One of the Giant Guns Which Supported the Americans 3805.
First Aid in the Trenches 3806.
A Few of the Millions Who Fought Back of the Lines 3807.
The Cost of the World War 3809.
"Hey, Buddy, Look at the Statue of Liberty!" 3811.
A Sacrifice to the Grim God of War 3834.
Here Sleep the Brave Near Belleau Wood 380.

## AMERICAN HISTORY

Note: Portraits of all the Presidents of the United States will be found with their respective articles and are not listed here.
Buildings that Tell Us of Mexico's Vanished Civilization 289.
The Great Aztec Calendar Stone 289.
The Aztec God of the Winds 290.
Ruins of a Cliff-Dwelling 205.
Why the Indians of Today Shun These Ruins of Yesterday 793.
Cliff Dwellers' Temple of the Sun 794.
Cortez and the Cross 895.
Jacques Cartier Meets an Indian 651.
Hudson Cast Adrift to Perish in the Arctic 1691.
Sieur de La Salle, Explorer of the Mississippi 1964.
Map Showing Routes of Explorers 110.
Dramatic Episodes in American History 3603.
The Making of the Nation—A Map-Story 3605.
Exact Representation of the Historic "Mayflower" 2175.
The Red Man with the White Man's Tongue 2177.
The Foundation Stone of New England 2841.
The Home of Captain Miles Standish 2842.
Plymouth, Two Years After the Pilgrims Landed 2842.
The Pilgrims Find Baskets of Corn 2843.
Puritans on Their Way to Church 2937.
Indian Life in the Tepees of Older Days 1764.
William Penn Founder of Pennsylvania 2717.
Young George and the Champion Wrestler 3675
George Washington as a Surveyor 3676.
Washington Throwing a Stone Across the Rappahannock 3677.
Washington Leaving the Hall to Await the Vote 3679.
The Scene of the Historic Fight with the Pequot Indians 867.
Connecticut's Famous "Charter Oak" 867.
Washington's Home at Mount Vernon 2358.
Historic Sites of Boston 471.
Boston Receives the Tidings of Liberty 975.
The Great Franklin of the Busy Brain 1359.
Patrick Henry, the Orator of the Revolution 1638.
Jefferson Listening to the "Treason Speech" 1881.
The "Washington Elm" 1138.
Where the Battle of Lexington was Fought 2169.
George Rogers Clark, Conqueror of the Old Northwest 783.
John Paul Jones, First Naval Hero of the United States 1901.
Monument to Lafayette 1956.
Alexander Hamilton, First Secretary of the Treasury 1569.
Lewis and Clark, First to Cross the United States 1989.
"Bird Woman" 1990.
America's Most Illustrious Family 13.
John Marshall, America's Greatest Jurist 2155.
The First American Locomotive 2963.
Henry Clay, the Great Pacificator 785.
Commodore Perry at the Battle of Lake Erie 3671.
James Lawrence, the Man Who Wouldn't Give Up the Ship 1973.
"Old Ironsides" 2423.
Chicago in 1836 and Today 722.
The Overland Route in Early Days 584.
Garrison in the Office of the 'Liberator' 1400.
John C. Calhoun, Champion of States' Rights 575.
Daniel Webster, America's Most Brilliant Orator 3711.
Jefferson Davis, Only President of the Confederate States 967.
Incidents in Lincoln's Conduct of the Civil War 2015.
General Sherman, Soldier of the Civil War 3205.
Ulysses S. Grant, Great Commander of the Union Forces 1498.
General Robert E. Lee, Military Genius of the South 1983.
George G. Meade, Union Commander at Gettysburg 1453.
The Climax of Gettysburg 1453.
The Tented Field of Gettysburg, 50 Years After 1454.
David Glasgow Farragut, Hero of Mobile Bay 1225.
The "Blue" and the "Gray" 776.
The Monitor "Montauk" Destroys the "Nashville" 777.
Lee's Surrender to Grant 781.
Pictured Facts About the Civil War 778, 779.
Cost of the Civil War 781.
The Brave Battle for Women's Rights 148.
George Dewey, Victor of Manila Bay 1000.
Admirals Sampson and Schley 3306.
Lieutenant Hobson, Hero of Spanish-American War 3307.
George W. Goethals, Master Engineer of the Panama Canal 1477.
William Crawford Gorgas, Who Vanquished the Mosquito 1490.
Roosevelt Tells Kipling All About Everything 3061.
Admiral Sims, American Naval Leader in the World War 3243.
John J. Pershing, Army Leader in the World War 2732.

James Cardinal Gibbons, Great American Churchman 1458.
Herbert Hoover Food Administrator of the World War 1679.
Charles Evans Hughes, Statesman and Reformer 1693.
In the House of Representatives—President Harding Delivering His First Message to Congress 3595.
The Historic Executive Mansion 3734.
Immigrants on the Way to the "Promised Land" 1738.
Americans in the Making 1739.
Picture Story of Canada's Thousand Years 619.
The Old Cannon and the Walls of Quebec 620.
Sir John Macdonald, Builder of Canada 2096.
Lord Strathcona "Grand Old Man of Canada" 3369.
Sir Wilfrid Laurier, Famous Canadian Premier 1971.
Sir Robert Borden, Canada's War Premier 467.

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Modern Egypt. Earl of Cromer.
Life of David Livingstone. Thomas Hughes.
How I Found Livingstone. Sir Henry Morton Stanley.
The New Map of Africa. Herbert A. Gibbons.

# Interest-Questions in History

What king sat on his throne for more than 300 years? 1.
Where is there a painting 50,000 years old? 2628 (picture).
How do we know that 10,000 years ago European lakes were inhabited by men? 1957.
How did a pick and shovel make a myth come true? 29, 3137–8.
Why wasn't India conquered by Alexander the Great? 87.
How did Alfred the Great defeat the Danes by singing? 90.
Why is Albania called the "stepchild of Europe"? 79.
What present king studied shipping by being a reporter? 81.
What European ruler agreed to divide the world with Napoleon? 85.
Who discovered America 500 years before Columbus? 109.
What Englishman lost his life through Benedict Arnold? 123.
Why was a citizen of the United States fined $100 in 1872 for voting? 149.
How did science keep the Romans out of Syracuse three years? 175.
Between what two countries does a colossal bronze figure stand as a symbol of peace? 192.
How did Aristides help to banish himself? 195.
What great philospher through one pupil sent the culture of his country throughout the civilized world? 196.
How did Sir Francis Drake "singe the Spanish King's beard"? 210.
What great king was overthrown by Cortez when he conquered the new world? 288.
What ancient people were first to use iron weapons? 297.
What European king owned an African state independent of his kingdom? 859.
What great English essayist, philosopher, and statesman was convicted of receiving bribes? 301.
Who was the great leader in South American revolts against Spain? 448.
What famous king followed a spider's example and led his army to victory? 518.
What king's heart traveled without him? 518.
How did a disease bring the Middle Ages to a close? 433.

*consult the Easy Reference Fact-Index at the end of this work*

Why did the Portuguese give Bombay to England? 451.
What explorer received ten pounds for discoveries in the New World? 561.
Why was Cairo built on the east bank of the Nile? 566.
How did the coming of a weary traveler to Geneva influence the democracy of the United States? 587.
What famous English explorer advertised Newfoundland Banks? 616.
What gave Canada an English speaking population? 617.
Why did a Norse king of England order the sea to fall back? 639.
How did victory for the little colony of Quebec in 1610 lead to defeat in 1759? 687.
What early Frank put down anarchy? 688.
Why did the old Venetians throw a wedding ring in the sea every year? 26.
What emperor, brave in battle, feared mice and spiders? 691.
What king owed his throne to a girl general? 695.
What battle is called "the Battle above the Clouds"? 700.
What early government always had two kings at the same time? 3309.
How can stones tell the progress of man? 3361.
What famous New York governor had a wooden leg? 3375.
How did a thistle save the Scots from Norse invaders? 3489.
What general of the Civil War fought and won a battle while the order for his removal was on the way? 3490.
What great conqueror was born in the same year as the man who finally conquered him? 3716.
At what period in the history of the world were the poor paid to enjoy music and drama? 2729.
How did 300 Spartans keep back 200,000 Persians for two days? 2740.
How did the keeping of accounts give us our alphabet? 2774.
What myth influenced the discovery of Florida? 2878.
When did a whole nation go on a strike? 3043.
Why did the admission of Missouri as a state lead to a bitter quarrel? 2273.
With what religion did Mohammed wish to ally himself? 2276.
How did being blind in one eye help a famous English naval officer to victory? 2435.
Where and when were the Spaniards defeated by the ocean? 2443.
What great empire did Rurik the Northman found? 2528, 2527 (picture).
How many hundreds of years after the Crusades did the Christians as conquerors enter the Holy Land? 2643.
What tiny desert kingdom defied the Roman Empire? 2648.
What great explorer was killed by the natives of Hawaii? 874.
Who was England's "Royal Bluebeard"? 1636.
What forces of the Allies in the recent World War were driven by the Germans into lakes and bottomless mires? 1650.
What famous early explorer was cast adrift by his men to perish in the Arctic? 1690.
How was Greek influence brought to India? 1752.
How did a king and queen give to Europe a new nation and to the world a new continent? 1832.
How was a baby responsible for a revolution in England? 1861.
When in the History of the United States was socialism tried? 1861.
How did the people of Java become Mohammedans? 1879.
How was the territory of the United States doubled at one stroke of the pen? 2073.
How did Magellan navigate the globe although he died in battle with natives in the Pacific Ocean? 2116.
What woman was the wife of a king but not his queen? 2129.
Who were the first world merchants who came to England for tin? 1151.
When in the history of Paris did the price of rats rise to 60 cents apiece? 1356.
What president of the United States only served four months? 1399.
What little newspaper helped to free the slaves? 1401.
How did a single monk stop the gladiatorial contests of ancient Rome? 1466.
Why is William Crawford Gorgas called one of "America's Greatest Conquerors"? 1490.
What man in middle life rose from a common clerk to a great general and president of the United States? 1498.
What Athenian fleet might be compared to the Invincible Armada of the Spaniards? 1524.
How did ancient Greece educate its conqueror? 1525.
What English queen reigned only nine days and died on the scaffold? 1542.
Why did the invention of gunpowder help democracy? 1552, 773.
What famous king was killed just as his troops won a great battle? 1554.
What nation prevented any discussion of disarmament and arbitration in the Hague peace conference in 1907? 1559.
About what English king was it said, "No man so good was ever so bad a king"? 693.
What French king, too stingy to buy himself a new hat, helped to unify France? 2065.
How does the ill fame of the de'Medici family pop out in France? 696.
Why was there no such date as October 5th in the year 1582? 574.
Why were the Moslems unable to defeat Charles Martel? 697.
What king returned from war with only two companions? 698.
What silver tongued orator of Rome lost his life because of his famous "Philippics"? 765.
Which was the first permanent settlement in America? 716.
Why did George Rogers Clark die in poverty when he owned 8,049 acres of land in Indiana? 783.
What beautiful queen conquered two great warriors with her charms but failed with the third? 789.
Why was the name of the Thracian slave Spartacus terrible to the Romans for many years? 3310.
What Englishman ran away to New Orleans, fought in the Civil War, and helped open up a continent? 3339.
What street in New York is still named after the farm of Peter Stuyvesant? 3375.
What foreign minister of France was able to keep his position through the Directory, the Napoleonic Empire, and the restored Bourbon Monarchy? 3430.
The name of what vice-president of the United States has always been connected with treason? 542.
How did the phrase "give your John Hancock" originate? 1570.
Who was the earliest European to describe the city of Hangchow, China? 1574.
How did the phrase "Fabian policy" originate? 1575.
How was the Hanseatic League broken up by herrings? 1576.
How did the Northmen finally conquer the English from the south instead of the north? 1589.
The history of what great war is written in embroidery? 1596.
How much did Bunker Hill cost the British? 533.
Why were the Crusades a blessing to Europe? 551.
Why did the response of Europe to the Byzantine Emperor's call for help lead to the downfall of the Empire? 552.
What early American orator and political leader was called the Great Pacificator? 785.
What great French leader in the World War at one time taught in a girl's school in Connecticut? 786.
Why were castles built during the Middle Ages? 654.
By what maneuver did the Thebans defeat the Spartan phalanx? 3486.
How did throwing a king's representatives out of a window involve Europe in 30 years of war? 3488.
How did the English government break up the first great labor movement in 1381? 3572.
How did Germany help to make the American troops of Valley Forge into an efficient army? 3615.
What great queen ruled 64 years? 3639.
Which one of the Great Lakes was the scene of a naval engagement between the English and Americans? 2730.
What country recently had for its leader a musician? 2856.
How did the French king Louis XIV avoid entertaining Peter the Great? 2747.
What czar worked in a shipyard? 2747.
What Spaniard received a room full of gold and two rooms full of silver as ransom for a great Indian chief? 2814.
What early European served as a minister extraordinary for the Grand Khan Kublai? 2874.
Why do we know so much about the private life of the Romans? 2876.
To which one of Alexander's generals was Cleopatra related? 2931.
Why did a European monarch live in South America for many years? 2890.
What great Mohammedan leader is remembered because of his courtesy and kindness of heart? 3111-2.
When was Florence a city of Puritans? 3131.
Why was the scallop the pilgrim's badge in the Middle Ages? 3134
Why were Austria, Russia, and France referred to in the Seven Years' War as the "League of Three Petticoats"? 3180.
Why was Queen Mary I of England called Bloody Mary? 2157.
What Scottish queen was forced to abdicate in favor of her infant son? 2158.
What Italian patriot was sentenced to death three times? 2178.
How did a tiny club grow into a revolution? 1859.
What French nobleman took part in three revolutions on the popular side? 1957.
Who were the first Europeans to visit Japan? 1869.
What king stood in a courtyard barefoot for three days in midwinter in order that he might win back his kingdom? 1632.
Why did General Braddock suffer defeat from marching into the wilderness with drums beating and banners flying? 1362.
What great English statesman chopped trees for exercise? 1469.
What were the trade unions of the Middle Ages called? 1459.
What man first gave France national unity? 810.

# MYTHOLOGY

THE fascinating stories of Mythology represent the first efforts of primitive people to explain the origin of the world and to solve the mysteries of life which surrounded them. Woven out of the fresh imaginations of ancient generations and carried down through ages of popular approval, they need no justification on the score of interest. But in addition to this ever-renewed interest, Mythology serves many other purposes, often overlooked. A study of these stories helps us, for instance, to understand the early history and customs of the people who originated them. In this connection, a comparison of the myths of different early peoples often indicates that they had the same origin and thus sheds light upon prehistoric connections of race and culture. On the other hand, a study of the broad human similarities to be found in the myths of widely separated peoples is of the utmost value to the student of sociology and social psychology. And finally a ready understanding and appreciation of many of the finest passages in our literature is impossible unless the reader is familiar with the classical myths to which allusions are so frequently made.

I. **BABYLONIAN MYTHS OF LIFE AND DEATH: 299—Etana, the Shepherd Who Attempted to Fly; Adapa, A Fisherman Who Refused Immortality; Babylonian Story of the Flood.**
II. **ANCIENT EGYPTIAN MYTHOLOGY: 1105.**
A. **Osiris:** Legendary King of Egypt and Chief of the Gods 2602.
B. **Isis:** The Moon Goddess, Wife of Osiris 1832.

## Greek and Roman Mythology

THE Mythology of the ancient Romans, a practical people, is based very largely on that of their imaginative and poetical Greek neighbors. Certain native Latin divinities have retained an individuality in Roman literature, but we find that the chief Roman deities came to be identified with certain Greek gods and goddesses, whose characteristics and adventures they assumed. For this reason we shall consider Greek and Roman Mythology together, giving the Roman names in parantheses after the Greek names.

I. **ANCIENT GREEK THEORY OF THE CREATION:**
A. **The Origin of Heaven and Earth:** How **Uranus** (Heaven) and **Gaea** (Earth) Came into Being (3607); Their Children—the **Cyclops, Hundred-Handers,** and **Titans** (944, 3607); Temporary Power of **Kronos** and **Rhea,** and How Their Son, **Zeus,** Finally Became the Ruler of the Universe (3607, 3838).
B. **The Origin of Man:** The Greeks held several theories regarding the creation of man. One story relates that **Prometheus,** son of the Titan Iapetus, fashioned man at the request of the gods. By his devotion to mankind, however, Prometheus so enraged Zeus that Zeus caused a woman, **Pandora,** to be made to bring trouble to man (2663), and ordered Prometheus chained to a rock (2921). When, later, men had fallen into evil ways, Zeus destroyed them by a flood, saving only **Deucalion,** son of Prometheus, and his wife **Pyrrha** (1000).

II. **HEAVEN AND THE DEITIES WHO DWELT THERE:** The Heaven of the Greek gods was a high mountain, **Olympus,** with a gate of clouds, opened by the Hours or Seasons to permit the passage of the heavenly deities to earth and to admit them on their return. Each god had a separate dwelling, but at the command of Zeus all repaired to his palace, even those deities who usually dwelt on the earth or in the waters or the underworld. There they feasted on ambrosia and on nectar poured by **Hebe,** as they discussed the affairs of the universe or listened to the music of **Apollo** and the **Muses.** At the setting of the sun all returned to their respective dwellings.
A. **The Greater Gods Who Dwelt on Mount Olympus:**
a. **Zeus (Jupiter), Son of the Titans, Kronos and Rhea:** Supreme Ruler of the Universe 3838, 2580.
b. **Hera (Juno), His Sister and Wife:** Queen Goddess and Guardian of Women 1639.
c. **Apollo, Son of Zeus and Leto (Latona):** God of Light and Manly Beauty and of Prophecy, and in Later Times the Sun-God 155, 991.
d. **Artemis (Diana), Apollo's Twin Sister:** Virgin Goddess, Huntress, as Well as Guardian, of Wild Beasts, and Later, the Moon-Goddess 220.
e. **Ares (Mars), Son of Zeus and Hera:** God of War 2154.
f. **Hephaestus (Vulcan), Son of Zeus and Hera:** God of Fire (Especially Volcanic Eruption, Incendiary Flame, and the Glow of the Forge) and the Blacksmith of the Gods 1639.
g. **Aphrodite (Venus):** Goddess of Love, Who Sprang Full Grown from the Sea-Foam 155.
h. **Hermes (Mercury), Son of Zeus:** Cunning and Swift-Footed Messenger of Heaven 1644.
i. **Athena (Minerva), Who Sprang Full Grown from the Brow of Zeus:** Goddess of Storms, of War, and of Wisdom, of Spinning and Weaving, and of Agriculture, and Protectress of Cities 248.
j. **Hestia (Vesta): Sister of Zeus and Eldest Daughter of Kronos and Rhea:** Goddess of the Hearth and Divinity of the Home 3634.
B. **Most Noteworthy of the Lesser Deities of Heaven:**
a. **Eros (Cupid):** Small God of Love, Son of Aphrodite 939.
b. **Hebe, Daughter of Zeus and Hera:** Cup-bearer of the Gods 1624.
c. **Ganymede:** a Trojan Boy Who Succeeded Hebe as Cup-bearer 1393.
d. **The Graces, Daughters of Zeus:** Goddesses Who Presided over Social Matters 155.

e. **The Muses, Daughters of Zeus:** Presided over the Arts and Sciences 2373.
f. **Themis, a Titan, Daughter of Uranus:** Goddess of Justice Who Sat Beside Zeus on His Throne.
g. **The Fates:** Controlled Human Destiny 1225.
h. **Nemesis, Daughter of Night:** Pepresented Righteous Anger and the Vengeance of the Gods 2436.
i. **Aesculapius, Son of Apollo:** His Function was the Art of Healing 679, 3257.
j. **Boreas, Zephyrus, Notus, and Eurus:** The Winds 29. **Aeolus,** King of the Winds, was not a Lesser Divinity of Heaven, but dwelt on the precipitous isle of Aeolia 29.
k. **Helios, Selene, and Eos (Aurora), Children of the Titan Hyperion:** Helios, Charioteer of the Sun was the more ancient Greek Sun-god, frequently identified with his successor Apollo 2759. Selene was the early Moon-goddess, whose attributes and adventures were later merged in those of Artemis. Eos was the rosy-fingered goddess of Dawn, mother of the stars and of the morning and evening breezes 259.
l. **Phosphor,** the Morning Star, and **Hesper,** the Evening Star, Sometimes Identified with Phosphor.
m. **Orion, Son of Neptune:** Mighty Hunter 2601, 2838.
n. **Eris (Discors):** Goddess of Strife 3542.
o. **Iris:** Goddess of the Rainbow 2972.
p. **Nike (Victoria):** Goddess of Victory.

III. **THE EARTH AND THE GODS WHO MADE IT THEIR ABODE:** The Greeks believed that the earth was a flat circle in the center of which was either Mount Olympus or Delphi, famous for the oracle of Apollo. It was crossed from east to west by the Sea (the Mediterranean and Euxine or Black Sea), while around it flowed in a steady current the Ocean Stream (personified as the Titan Oceanus), from which the Sea and all rivers received their waters. Beyond the mountains of the North Wind, in a region inaccessible by land or sea, dwelt the Hyperboreans, in bliss and everlasting spring. In the south, close to the Ocean, dwelt the Ethiopians, a people greatly favored by the gods. On the western margin lay the **Elysian Plain,** the abode of the blessed (1558). The Dawn, the Sun, the Moon, and most of the Stars rose out of the Ocean to give their light to man.

A. **The Chief Gods of Earth:**
a. **Demeter (Ceres), Sister of Zeus:** Goddess of Agriculture and of Civilized Life 991.
b. **Gaea or Ge, the Mother Earth, Wife of Uranus:** One of the Older Order of Gods 3607, 1640.
c. **Rhea, Wife of Kronos and Mother of Zeus:** Another Goddess of Earth 3607.
d. **Dionysus (Bacchus), Son of Zeus and Semele:** God of Wine and of Animal Life and Vegetation 1012.

B. **The Lesser Divinities of Earth:**
a. **Pan, Son of Hermes:** God of the Flocks and Pastures, of Fields and Forests 2648.
b. **The Nymphs,** Including the **Dryads** or Tree Nymphs; the **Oreads,** Nymphs of the Mountains and Grottoes; and the **Napaeads,** Shy Valley Nymphs: 2546.
c. **The Satyrs (Fauns):** Queer Goatlike Deities of Woods and Fields 1012, 2648.

IV. **THE UNDERWORLD AND ITS DIVINITIES:** "Beneath the secret places of the Earth" lay a realm of darkness, bounded by awful rivers—the sacred **Styx** and **Acheron,** river of woe—where **Hades,** whose name is given to the region, in a dark and gloomy palace haunted by strange apparitions, ruled the spirits of the dead 1558.

A. **Principal Deities of Hades:**
a. **Hades (Pluto), Brother of Zeus:** Ruler of the Underworld and Lord not only of All that Descends into the Earth, but of All that Proceeds from It 1558.
b. **Persephone (Proserpina), Daughter of Demeter and Wife of Hades:** Goddess of Death and also Spring 991.

B. **Lesser Divinities:**
a. **Aeacus, Rhadamanthus, and Minos, Sons of Zeus and Judges of the Dead:** Minos During His Life had been King of Crete 1640.
b. **Eumenides or Erinyes (Furies), Born of the Blood of Wounded Uranus:** Deities Who Attended Persephone and Punished Those Who had Escaped from or Defied Justice 1382.
c. **Hecate:** Mysterious Deity Who Represented the Darkness and Terrors of the Moon, Goddess of Sorcery and Witchcraft 1626.
d. **Hypnos (Somnus) or Sleep and Thanatos or Death, Sons of Night:** The first brought solace and fair dreams to mortals and the other closed their eyes forever. Dreams dwelt beside Death in an abode with two gates through one of which issued false dreams and through the other those which were true and noble.

V. **THE GODS OF THE WATERS:**

A. **The Older Dynasty:** The Sea had two sets of rulers, the earlier of which flourished during the reign of Kronos. The Titan **Oceanus** and his sister and queen **Tethus,** from whom sprang thousands of rivers and numerous ocean-nymphs, ruled the waters from their beautiful palace beyond the boundaries of Earth. There was also **Pontus** (the deep sea), who was the father of **Nereus,** a genial old man famous for his prophetic gifts and his love of truth and justice. Nereus' wife was **Doris,** and their children were the fifty fair **Nereids.** Of these beautiful daughters the most famous were **Panope, Galatea, Thetis** (2546), and **Amphitrite.**

B. **The Younger Dynasty:**
a. **Poseidon (Neptune), Brother of Zeus:** Ruler of the Waters 2891.
b. **Amphitrite, Daughter of Oceanus and Wife of Poseidon.**

c. **Triton, son of Poseidon:** a Lesser Divinity, Trumpeter of Ocean.
d. **Proteus:** Little Old Man of the Sea. He had prophetic powers and could change his shape at will 2926.
e. **The Harpies, Children of Thaumus, a Son of Pontus and Gaea:** 1591.
f. **The Graeae:** Three Hoary Witches, Gray-Haired from Birth: 2731.
g. **The Gorgons:** Three Horrible Sisters, Whose Glance was Death 2731.
h. **The Sirens:** Sea Muses Who, by Their Singing, Lured Mariners to Destruction 2562.
i. **Scylla:** Six-Headed Monster Destructive to Mariners 2563.
j. **Atlas:** A Titan, Who Supported the Heavens on His Shoulders. In later times he was regarded as a mountain rather than as a divinity of the sea 1640, 2732. Three groups of nymphs—the **Pleiades** (2838), **Hyades,** and **Hesperides** (1640), although daughters of Atlas, were not themselves divinities of the sea.
k. **The Water-Nymphs—the Odeanides, Nereids, and the Naiads:** The last of these daughters of Zeus, were of most importance 2546.

VI. **ITALIAN GODS:** Besides the Roman gods already mentioned, there were certain other deities always peculiar to Roman Mythology. Among them the most important were: **Saturn,** the introducer of agriculture (whom some have attempted to identify with Kronos), and **Ops,** his wife, goddess of sowing and harvest (later confounded with Rhea) 3129; **Janus,** god of doors or of beginnings, the most important native Italian deity 1861; **Quirinus,** a war god, the deified Romulus 3053; **Bellona,** a war goddess; **Lucina,** a goddess of light and of childbirth (a name applied to both Juno and Diana); **Faunus,** grandson of Saturn, god of fields, of shepherds, and of prophecy (his name in the plural refers to a group of woodland deities like the Greek Satyrs 2648, 1012); **Sylvanus,** god of the forest glades; **Pates,** goddess of cattle and pastures; **Flora,** goddess of flowers 2175; **Pomona,** goddess of fruit trees 1566; the **Lares** and **Penates,** household gods, the former being considered as the deified spirits of ancestors who watched over their descendants 3635. **Sol** (the Sun), **Luna** (the Moon), **Juventas** (Youth), **Fides** (Honesty), **Fortuna** (Fortune) 1333, and other personifications were also worshiped by the Romans.

VII. **LEGENDARY HEROES:** Besides these divine beings, the Greeks and Romans held in veneration a large number of demigods and heroes, of matchless worth and valor and endowed with godlike qualities which they employed in the service of mankind—in the destruction of monsters, the founding of cities, the winning of wars, and the like. Some of these legendary heroes were offspring of the gods and many of them were direct descendants of Deucalion. In the stories of some of their exploits there is a shadowy historical background, but their chief value historically is in the information they give of early life in the lands about the Aegean Sea.

A. **Older Heroes:** The following and their contemporaries may be called the Older Heroes; with them belong **Prometheus** and **Deucalion,** whose stories have been told in connection with the Creation of Man.
a. **Perseus:** Hero of Argos, Son of Zeus and Danae, who was the Daughter of King Acrisius of Argos 2731.
b. **Heracles (Hercules):** National Hero of the Greeks, son of Zeus and Alcmene, the Granddaughter of Perseus 1640.
c. **Cadmus:** Founder of Thebes, a Descendant of Zeus 563.
d. **Orpheus:** Famous Musician, Son of Apollo and the Muse Calliope 2601.
e. **Minos:** King of Crete, Son of Zeus and Europa 3487.
f. **Oedipus:** King of Thebes, Descendant of Cadmus 2566.
g. **Theseus:** Son of King Aegeus of Athens, a "Second Hercules," Slayer of the Minotaur 3487.
h. **Jason:** Heir to the Throne of Iolcus in Thessaly, Leader of the Argonauts 193.
i. **Peleus:** Grandson of Zeus, Husband of Thetis a Sea Nymth, and Father of Achilles.
j. **Pelops:** Son of Tantalus.
k. **Castor and Pollux:** Twin Sons of Zeus 657.

B. **The Younger Heroes:** These were sons and grandsons of the Older Heroes and chieftains in the Theban and Trojan Wars and in numerous other military expeditions. Their exploits are narrated in four stories: **The Seven Against Thebes, The Siege of Troy, The Wanderings of Odysseus (Ulysses),** and **The Adventures of Aeneas.** Among them were **Achilles, Nestor, Agamemnon, Hector, Aeneas,** and many other valiant warriors.

VIII. **MYTHS OF THE GODS:**

A. **Stories of the Greater Gods:**
a. **Myths of Zeus:** His Love for Io 1802; Zeus and Callisto, a Maid of Arcadia 872; Abduction of Europa 563; The Punishment of Tantalus 3433.
b. **Myths of Athena: 248**—Her Birth; Helping the Greeks at Troy; the Naming of Athens; Weaving Contest with Arachne.
c. **Myths of Apollo and Artemis:** Apollo and the Deadly Python 156; Hyacinthus and Apollo 1706; The Punishment of Niobe 2510; Apollo's Revenge on King Midas 2230; The Musical Contest of Apollo and Marsyas 156; Apollo's Love for the Nymph Daphne 962; The Fate of Acteon at the Hands of Artemis 220; Orion and Artemis 2601.
d. **Myths of Aphrodite:** Birth 155; Aphrodite and Adonis 26; Wedding of Aphrodite and Hephaestus 155; Atalanta's Race 247; Hero and Leander 1645.
e. **Some Early Adventures of Hermes: 1644.**
f. **The Battle of Ares and Diomede: 248.**

g. Dionysus and the Pirates **1012**; Midas and Dionysus **2230**.
h. Abduction of Persephone by Hades: **991**.
i. Poseidon and the Building of Troy **2891**.

B. Myths of the Lesser Divinities:
a. Myth of Phaethon, Son of Helios, and the Nymph Clymene: **2759**.
b. Aesculapius and Chiron: **678**.
c. Myth of the Pleiades, Nymphs of Artemis' Train: **2838**.
d. Cupid and Psyche: **939**.
e. Aurora and Tithonus: **259**.
f. Pan and Syrinx: **2376**.
g. Echo (an Oread) and Narcissus: **1073, 2397**.
h. Myth of the Dryads: **2546**.

IX. MYTHS OF THE DEMIGODS AND HEROES:
A. Stories of the Older Heroes:
a. Myths of Perseus: **2731**—The Doom of King Acrisius; Perseus and Medusa; Perseus and Atlas; Perseus and Andromeda.
b. Myths of Heracles: **1640**—His Youth; His Labors; Further Exploits; Death.
c. The Argonauts' Quest of the Golden Fleece: **193**.
d. Myths of King Minos of Crete: The Minotaur 1640; Daedalus and Icarus 949.
e. Myths of Theseus: Theseus and Ariadne 3487; Theseus and Pirithous and the Battle with the Centaurs 3487, 678.
f. Orpheus and Eurydice: **2601**.
g. Founding of Thebes by Cadmus: **563**.
h. Myths of Oedipus: **2566**—Youth; Murder of His Father; Oedipus and the Sphinx; Oedipus and King; Exile and Death.

B. Myths of the Younger Heroes:
a. The War Against Thebes: **2566**—Causes; Antigone; Creon Becomes King.
b. The Trojan War.
1. Its Origin: The Story of Paris, Son of King Priam of Troy 2680; Marriage Feast of Peleus and Thetis 3542; Paris Abducts Helen, Wife of King Menelaus 3542.
2. Greek Heroes Who Took Part: Achilles, Son of Peleus and Thetis, the Bravest of the Warriors 8; Odysseus, King of Ithaca 2562; Ajax the Great, Second only to Achilles in Strength and Bravery 69; Agamemnon, King of Mycenae, Commander-in-chief of the Greek Forces; Gallant Diomedes, Aged Nestor, King of Pylos, and others.
3. Chief Trojan Leaders: Hector, Son of King Priam, One of the Noblest Figures of Antiquity 1626; Aeneas, Son of Anchises and Aphrodite 29. Among the Trojans' Allies was Memnon, King of Ethiopia 2196.
4. Story of the War: **3543**. The Wrath of Achilles 8; the Shield of Achilles 9; Battles of Diomedes 155, 248; the Amazons 106; the Death of Hector 1626; Story of the Wooden Horse and the Fall of Troy 3543; the Return of Menelaus to Greece 2926.
c. The Wanderings of Odysseus: The Lotus-Eaters 2562; the Cyclops 944; the Bag of Winds 29; Odysseus and Circe 767; the Sirens 2562; Scylla and Charybdis 2563; the Island of Calypso 2563; the Princess Nausicaa 2564; Penelope and the Suitors 2564; Return of Odysseus 2565.
d. Adventures of Aeneas **29**.


# Norse and Teutonic Mythology

THE Mythology of the Northmen, who inhabited the countries now known as Sweden, Denmark, Norway, and Iceland. has come down to us chiefly through the Eddas and Sagas (3134). Although it is distinct from that of the Greeks and Romans, a certain similarity is apparent in many essential features. Cradled in the frozen North, the Scandinavian myths image the spirit of the hardy Viking race, and while their gods lack the graceful fancy of the Greek deities, they have a rugged personality well calculated to inspire the warlike Northmen to deeds of prowess. The old Germanic peoples accepted the Norse deities as a whole for their own, and their myths are based so largely on the Scandinavian that they have retained little separate identity.

## I. THE GODS AND THEIR MYTHS:

A. **The Creation:** Scandinavian myths, like those of the Greeks, tell of the development of the world from darkness and chaos. Originally there existed a world of mist, a bottomless deep, and a world of light. From the mist-world issued twelve rivers whose frozen waters gradually filled up the bottomless deep. Then from the world of light issued warm winds which melted the ice, producing vapors which rose and formed clouds. From these clouds sprang **Ymir,** the rime-cold giant, and his progeny, and a cow, **Audhumbla,** whose milk furnished nourishment to the giant, and who in turn was nourished by licking the hoar frost and salt from the ice. Finally there appeared first the hair, then the head, and at length the whole form of a god of great beauty and power. This was **Bori,** from whom and his wife, a daughter of the giants, sprang **Odin, Vili,** and **Ve.** These three slew Ymir and from his body and blood formed heaven and earth. Of his eyebrows they built a fence around **Midgard,** the destined abode of man. Having created the world

they fashioned man from an ashen spar and woman from a piece of elm. To these first human beings Odin gave life and soul, Vili, reason and motion, and Ve, the sense, features, and speech. The universe was supported by **Ygdrasil,** a mighty ash tree (2560, 3534).

B. **Asgard, Abode of the Gods, and Its Chief Dieties: 2560, 3135.**
   a. **Odin or Woden:** Ruler of Heaven, Earth, and the Underworld, Who Lived in a Golden Palace Called Valhalla.
   b. **Frigga:** Odin's Wife, Who Knows All Things.
   c. **The Valkyries:** Warlike Virgins Mounted on Horses and Armed with Helmet, Shields, and Spears, Who Conveyed Fallen Warriors from the Battlefields to Valhalla.
   d. **Thor:** The Thunderer, Eldest Son of Odin 3490.
   e. **Bragi:** Son of Odin, and God of Poetry.
   f. **Iduna:** Bragi's Wife; Custodian of the Casket of Magic Apples, Which Produce Immortal Youth 3135.
   g. **Balder:** Son of Odin; Beautiful God of Sunlight, Spring, and Gladness 306.
   h. **Hoder:** Son of Odin, Blind God of Winter.
   i. **Frey:** God of Fruitfulness; **Freyja:** His Sister, Goddess of Love.
   j. **Tyr:** A Wrestler, "God of Battles."
   k. **Loki:** The Mischief-Maker, Who, Though of the Demon Race, Forced Himself into the Company of the Gods. One of his children was the **Migard Serpent,** who encircled the Earth.

C. **Jotunheim and the Frost Giants, Enemies of the Gods 2560, 3490.**

D. **Some Myths of the Gods:**
   a. **Odin at the Fountain of Knowledge: 2560.**
   b. **The Apples of Iduna: 3135.**
   c. **Thor's Visit to Jotunheim: 3490.**
   d. **The Death of Balder: 306.**

II. **MYTHS OF NORSE AND OLD GERMAN HEROES:** In the Norse Saga of the Volsungs are gathered many ancient legends, with **Sigurd,** a great hero never equaled in comeliness, valor, and great-heartedness, as the central figure. The great epic, **Nibelungenlied,** is the German version of these hero-tales, with certain variations of name, character, and incident. Here Sigurd appears as **Siegfried.**

A. **The Story of Siegfried: 3230.**

B. **The Songs of the Nibelungs: 2504.**

# Books of Mythology, Folk Lore, and Fairy Tales

## FIRST AND SECOND GRADES

**In Mythland.** M. Helen Beckwith.
**Nature Myths of Many Lands.** Florence V. Farmer.
**Book of Nature Myths.** Florence Holbrook.
**Stories of the Red Children.** Dorothy Brooks.
**Legends of the Red Children.** Mara L. Pratt.
**Myths of the Red Children.** Gilbert L. Wilson.
**Nights with Uncle Remus.** Joel Chandler Harris.
**Uncle Remus and the Little Boy.** Joel Chandler Harris.
**Green Fairy Book.** Andrew Lang.
**Fairy Tales.** Jacob L. Grimm and Wilhelm Grimm; edited by Sara Wiltse for little children.
**Fairy Tales.** Hans Christian Andersen; edited by J. H. Stickney for little children.

## THIRD TO SIXTH GRADES

**Stories of Old Greece and Rome.** Emilie K. Baker.
**Stories of Greek Gods, Heroes and Men.** Samuel B. Harding.
**Gods and Heroes.** Robert E. Francillon.
**The Golden Fleece and the Heroes Who Lived Before Achilles.** Padraic Colum.
**The Story of Troy.** Michael Clarke.
**The Wonder Book for Girls and Boys.** Nathaniel Hawthorne.
**Old Greek Folk Stories Told Anew.** Josephine P. Peabody.
**Old Greek Stories.** James Baldwin.
**Story of the Golden Age.** James Baldwin.
**The Golden Fleece.** James Baldwin.
**Stories of the Ancient Greeks.** Charles D. Shaw.
**Wonder Stories.** Carolyn S. Bailey.
**Four Old Greeks.** Jennie Hale.
**Adventures of Ulysses.** Charles Lamb.
**Adventures of Odysseus.** F. S. Marvin and others.
**Child's Guide to Mythology.** Helen A. Clarke.
**Myths that Every Child Should Know.** Hamilton Wright Mabie.
**Heroes.** Charles Kingsley.
**Aesop's Fables.** Translated by V. S. V. Jones.
**Viking Tales.** Jennie Hall.
**Norse Stories Retold from the Eddas.** Hamilton Wright Mabie.
**Story of Siegfried.** James Baldwin.
**In the Days of Giants.** Abbie Farwell Brown.
**Stories of King Arthur and His Round Table.** Beatrice Clay.
**Old Indian Legends Retold.** Zitkala-Sa.
**Wigwam Evenings—Sioux Folk Tales Retold.** Charles A. Eastman and Elaine G. Eastman.
**Pueblo Indian Folk Stories.** Charles F. Lummis.
**American Indian Fairy Tales.** Margaret Compton.
**Indian Folk Tales.** Mary F. Nixon.
**Arabian Nights.** Edited by Kate Douglas Wiggin.
**Chinese Fables and Folk Stories.** M. H. Davis and Chow Leung.
**Japanese Fairy Book.** Y. T. O. Ozaki.
**Folk Tales from the Russian.** V. X. K. de Blumenthal.
**Russian Grandmother's Wonder Tales.** Louise Houghton.
**Cossack Fairy Tales and Folk Tales.** Robert Nisbit Bain.
**Norse Fairy Tales.** Peter C. Asbjornsen.
**Danish Fairy and Folk Tales.** Jens Christian Bay.
**Fairy Tales.** Hans Christian Andersen.
**Fairy Tales.** Jacob L. Grimm and Wilhelm K. Grimm.
**Fairy Tales from the Swedish.** N. G. Djurklou.
**English Fairy Tales.** Joseph Jacobs.
**Scottish Fairy Book.** E. W. Gierson.
**Celtic Fairy Tales.** Joseph Jacobs.
**More Celtic Fairy Tales.** Joseph Jacobs.
**Brown Fairy Book—Violet Fairy Book—Yellow Fairy Book—Blue Fairy Book** (4 vols.). Andrew Lang.

## SEVENTH AND EIGHTH GRADES

**Classic Myths in English Literature and in Art.** Charles Mills Gayley.
**Greek Hero Stories.** Barthold G. Niebuhr.
**Age of Fable.** Thomas Bulfinch.
**Golden Age of Myth and Legend.** Thomas Bulfinch.
**The Beliefs of the Egyptians.** F. H. Brookshank.
**The Myths of Greece and Rome.** Hélène A. Guerber.
**Story of the Iliad.** Alfred J. Church.
**Wonder Tales of the Ancient World.** James Baikie.
**Aeneid for Boys and Girls.** Alfred J. Church.
**Tales of Ancient Greece.** Sir George W. Cox.
**Tales of Troy and Greece.** Andrew Lang.
**Half a Hundred Hero Tales.** Francis Storr.

Stories from the Greek Tragedians. Alfred J. Church.
Book of Sagas. Alice Spencer Hoffman.
Viking Tales of the North. Rasmus Björn Anderson.
Handbook of Norse Mythology. Earl A. Mortensen.
Myths of Northern Lands. Hélène A. Guerber.
Boys' King Arthur. Sidney Lanier.
Knightly Legends of Wales, or the Boys' Mabinogion. Sidney Lanier.
The Age of Chivalry. Thomas Bulfinch.
Stories from the Faerie Queene. Mary MacLeod.
Hero Myths and Legends of the British Race. M. I. Ebbutt.
Merrie Adventures of Robin Hood. Howard Pyle.
Legends of Charlemagne. Thomas Bulfinch.
Story of Roland. James Baldwin.
Stories from Old French Romance. Ethel M. Wilmot-Buxton.
Eastern Stories and Legends. Mary L. Shedlock.
Stories of Persian Heroes. Ethel M. Wilmot-Buxton.
The Jewish Fairy Book. Gerald Friedlander.
Indian Fairy Tales (India). Joseph Jacobs.
Tales of the Punjab. Flora A. Steel.
Legends of the Rhine. Hélène A. Guerber.
Legends of Switzerland. Hélène A. Guerber.
Myths and Legends of the Great Plains. Katharine B. Judson.
Myths and Legends of the Mississippi Valley and the Great Lakes. Katharine B. Judson.
Myths and Legends of the Pacific Northwest. Katharine B. Judson.

### HIGH SCHOOL AND AFTER

The Mythology of All Races. L. J. Gray.
Myths and Myth-Makers. John Fiske.
The Golden Bough. J. G. Frazer.
Romance and Legend of Chivalry. A. R. H. Moncrieff.
Custom and Myth. Andrew Lang.
The Making of Religion. Andrew Lang.
Myth, Ritual, and Religion. Andrew Lang.
Contributions to the Science of Mythology. Max Müller.
Primitive Culture. E. B. Tylor.
The Dawn of History: an Introduction to Prehistoric Study. C. F. Keary.
Religion of Primitive Peoples. D. G. Brinton.
Religion of Ancient Egypt. P. L. Renouf.
Religion of Babylonia and Assyria. Morris Jastrow.
Sketch of Semitic Origins. G. A. Barton.
Mythology of the Aryan Nations. G. W. Cox.
Religions of India. E. W. Hopkins.
Bengal Fairy Tales. F. B. Bradley-Birt.
Norse Mythology. R. B. Anderson.
Teutonic Mythology. Victor Rydberg.
Mythology of the British Isles. Charles Squire.
Celtic Myths. Charles Squire.
Celtic Mythology. John Arnott Macculloch.
Russian Folk Tales. Aleksandr Athanasiev.
Flemish Legends. Charles de Coster.
Myths and Songs from the South Pacific. W. W. Gill.
Around the Wigwam Fire. J. H. Cornyn.
Myths and Legends of Our Own Lands. C. M. Skinner.
Myths of the New World. D. G. Brinton.
Latin-American Mythology. Hartley Burr Alexander.
Songs and Tales from the Dark Continent. Natalie Curtis.

# Interest-Questions in Mythology

What goddess sprang from the sea-foam? 155.
How did the ancient Greeks explain the change of seasons? 991-3.
Why is the laurel associated with poets? 962, 2848.
How did it happen that the most beautiful of the Greek goddesses became the wife of the most awkward of the gods? 155.
How did the ancient Greeks explain the origin of fire? 2921.
The name of what Roman god is contained in the word "vulcanize"? 1639.
What poet escaped death through his power of song? 194.
How did three golden apples help a hero to win a race and a wife? 248.
What great Greek city is named for a goddess? 249.
What woman, according to the Greeks, was responsible for all the ills of mankind? 2663.
What happened when a man was given immortal life without immortal youth? 259.
How, according to the Babylonians, was the gift of immortality lost to mankind? 299.
What girl was turned into a spider? 249.
What did the sowing of dragon's teeth have to do with the founding of a great city? 563.
What god had wings on his shoes? 1644.
What god was most often represented in Greek art? 157.
What twins were set among the stars after their death? 657.
What is meant when a horseman is said to "ride like a Centaur"? 678.
What sorceress changed men into beasts? 767, 768.
What woman brought disaster on herself through her curiosity concerning her husband? 939.
What connection is there between "cereal" and a Roman goddess? 993.
What goddess represented the dark of the moon? 1626.
Who, according to the ancient Greeks, was the first man to fly? 949.
What Babylonian hero attempted to soar to heaven on an eagle's back? 299.
What flower sprang from the blood of a beautiful youth? 1706.
How, according to the Greeks, did the peacock get the "eyes" in its tail? 1802.
Why should sudden unreasonable fear be called a "panic"? 2648.
What god mistook a stone for his child? 3607.
What Greek boy was carried off to heaven by an eagle? 1393.
How did the Romans get the name of their chief god? 1903.
What youth gazed at his own image until he was transformed into a beautiful flower? 2397.
How did the ancient Greeks think their poets and artists were inspired? 2373.
What substance, much valued for jewelry, came from the tears of maidens who wept for their dead brother? 2759.
How did the Northmen explain the coming of winter? 3135.
Who was the old woman whom no god could conquer? 3492.
How did a goddess unwittingly slay her lover? 2601.
How did a brightly polished shield help Perseus to slay a monster? 2731.
What hero removed his war helmet because his little son was afraid of it? 1626.
How was a northern hero enabled to understand the language of birds and beasts? 3231.
How did a Greek hero in trying to avoid harming his father unknowingly kill him? 2566.
How did Odysseus and his men get past the giant Polyphemus without being seen? 945.
What river in Africa was made to overflow by the tears of a goddess? 1832.
How did the god of the vine keep a ship from moving? 1012.
Who was the mischievous god that escaped from his cradle and began his adventures when only a few hours old? 1644.
Which of the Greek heroes was called "the crafty"? 2562.
What Roman heroes were brought up by a wolf? 3058.
What common metal was named after a god and why? 2199, 2200.
How did a goddess punish a mortal who saw her unattired? 221.
What goddess sprang from the head of Zeus? 248.
Who was the god of music? 156.
What planet is named after the Roman war god and why? 2154.
What strait was called "Oxford" in Greek and why? 468.
How was the lyre invented? 1644.
What flower is named after the goddess of the rainbow? 1814.
What happened when a rash youth attempted to drive the chariot of the sun? 2759.
Who was the first person to be "tantalized"? 3433.
What heroine dared to break the laws of a king in obedience to a higher law? 2566.
In what mythical country did women have all the rights? 106.
What hero in disguise was recognized by his dog though no one else knew him. 2565.
What Norse god gave an eye for wisdom? 2560.
After what god is the fourth day of the week named? 2560.
What wife of a Greek hero was noted for her fidelity? 2564.
How did a maiden in trying to protect her lover bring about his death? 3231.
How did the Northmen believe the universe was held together? 2560.
How did a wooden horse bring victory when brave warriors failed? 3543.
What teacher who was a half horse instructed many famous heroes? 678.
What old man of the sea tried to avoid prophesying by changing form? 2926.
How did a woman's beauty lead to a great war? 3542.
From what Greek hero is the tendon of the heel named and why? 8.
What flower sprang from the tears of a goddess? 123, 26.
What power moved the god of the underworld to allow one of the dead to return to life? 2602.
What river bound the oaths of men and gods? 2759.

# SOCIAL SCIENCES

UNDER the name of "Social Sciences" are included those branches of knowledge which deal with the problems of men in their relations with one another. Just as Biology is concerned with the natural laws which govern the physical structure and function of individual organisms, so the Social Sciences seek to discover the laws which govern the structure and function of social organisms. The Social Sciences deal with human conduct and with the influences which shape human conduct. In this sense, of course, their interest extends to all other fields of knowledge. Their own particular scope, however, is to define and describe the *general principles* which appear to govern human conduct, as opposed to History, for instance, which seeks primarily to narrate and interpret *particular instances* of human conduct. For practical purposes the primary Social Sciences are usually divided into Sociology (3270), Economics (1076), and Political Science or Government. The name Sociology is often applied broadly to the whole group of Social Sciences, but in its more restricted sense it deals with those phases of human conduct which are governed by usage and custom rather than those which are the outgrowth of political or economic necessity; it seeks to investigate the "social habits" of the human race and their effects upon human welfare. Economics deals with the activities of men in producing, distributing, and consuming the valuable things of the earth. Political Science deals with the organization and life of the state. The name of "Civics" is often given to that department of Political Science which deals with the practical machinery of our own government and our duties as citizens. The Science of Education, which deals with political as well as purely Sociological problems, has come to be so important that it is often made a fourth great division of the Social Sciences. The articles on Geography (1413), History (1653), and Civilization (771) will provide a valuable background for the review of the Social Sciences.

## Sociology

I. **ANTHROPOLOGY: 149.** The study of man's physical development, his place in nature, and the origin of culture, with particular reference to primitive life and the survival of primitive modes of living and methods of thought. Read also the article on Man 2133.

II. **ETHNOLOGY: 149.** The study of the various races and their customs, with a view of finding out their origin and relationships.
- A. **Races of Mankind: 2956, 3866.**
- B. **Cave Dwellers: 666.**
- C. **Stone Age: 3360.**
- D. **Superstitions and Magic Practices of Primitive Peoples: 2117.**
- E. **Mythology: 2385.**

III. **PHILOLOGY: 2770.** The science which deals with the formation of languages. By the study of words used by early peoples, scientists have been able to ascertain many important things about the people who made the words and their mode of life.
—Writing and Its Contribution to Civilization: 3816, 100, 773.

IV. **SOME IMPORTANT CUSTOMS AND INSTITUTIONS AND THEIR ORIGIN:**
- A. **Family: 1223.** Its origin and importance as a social unit.
- B. **Origin of Personal Names: 2388.**
- C. **Magic and Witchcraft: 2117, 3773.**
- D. **Folklore: 1316.** The tales and songs and dances which furnished amusement for the peoples of long ago, and the modern revival of Folk Dancing.
- E. **Architecture and What It Tells Us of Human Progress: 176.**
- F. **Costume and Adornment: 897.**
  - a. **Tattooing: 3440.**
  - b. **Armor: 214, 1933.**
  - c. **Uniforms: 3575.**
  - d. **Shoes of Different Periods and Lands: 3220.**
  - e. **The History of Hats and Origin of the Custom of Lifting the Hat: 1597.**
  - f. **How Buttons Came into Use: 548.**
  - g. **Ornamental Use of Feathers: 1229.**
  - h. **How Man has Toiled for Furs: 1389.**
  - i. **Lace and Its Early Uses: 1949.**
  - j. **Decorations of Honor: 976.**
- G. **Etiquette: 1183.** The essentials of good manners as established by custom.
- H. **Holidays and Festivals: 1673.**
  - a. **Arbor Day: 173.**
  - b. **Christmas and How It is Celebrated in Different Countries: 758.**
  - c. **Easter—Its Significance and Some Customs Connected with It: 1070.**
  - d. **Hallowe'en and Its Superstitions: 1566.**
  - e. **Memorial Day and Its Purpose: 2196.**
  - f. **New Year's Day in Various Parts of the World: 2478.**

g. The Passover: **2691.** The Jewish festival of freedom and how it is observed.
h. St. Patrick's Day and Some Legends of St. Patrick: **2694.**
i. The Sabbath and Its Observance: **3103.**
j. St. Valentine's Day and Its Customs: **3111.**
k. Thanksgiving Day and Its Origin: **3482.**
l. The Origin and Use of Fireworks in the Celebration of Holidays: **1264.**

V. AMUSEMENTS, GAMES, AND SPORTS:
A. Olympic Games of the Ancient Greeks: **2580.**
B. Gladiatorial Combats of the Romans: **1466.**
C. Medieval Tournaments: **1933, 3152.**
D. Modern Sports and Games:
a. Sports and Games of Physical Skill: Football 1324; Baseball 338; Cricket 919; Tennis 3469; Golf 1484; Hockey 1669; Curling 940; Polo 2873; Lacrosse 1954; Croquet and Roque 926; Boat Racing 444; Swimming 3410; Skating 3753; Skiing 3754; Basketball 343; Billiards 392; Bowling 475; Fencing 1231; Boxing 476; Wrestling 3815.
b. Indoor Pastimes: Charades 687; Checkers 707; Chess 716; Playing Cards 643.
c. Children's Games: **2834.**
d. The Function of Athletics: **251.**
E. Camping: **594.**
F. Toys and Dolls: **3521, 1025.**
G. Theaters and the Drama: **1031, 3482.**
a. Miracle and Morality Plays of the Middle Ages: **2259.**
b. The Pageant: **2625.** Its history and importance today.
c. Motion Pictures: **2341.**

VI. SOCIAL ORGANIZATIONS: In the complicated social life of today one great branch of man's activities centers about the clubs, societies, or lodges which have been formed for the pursuit of a common interest, whether it be philanthropic, civic, cultural, religious, or purely recreational.
A. Religious or Semi-religious Organizations:
a. Crusading Orders: **932, 2131.**
b. Salvation Army: **3119.**
c. Young Men's Christian Association: **3832.**
d. Young Women's Christian Association: **3833.**
e. Women's Christian Temperance Union: **3777.**
—Work of Frances Willard: **3737.**
B. Fraternal Organizations:
a. Freemasons: **1361.**
b. Knights of Columbus: **1935.**
c. Knights of Pythias: **957.**
C. Women's Clubs: **3777.**
D. Patriotic Societies in the United States: **2695.**
E. Boys' and Girls' Societies:
a. Boy Scouts and Girl Scouts: **479, 1464.**
b. Campfire Girls: **592.**
c. George Junior Republic: **1430.**

Note: For Gilds, Coöperative Societies, Labor organizations and so forth, see the Study Outline on Economics.

VII. PROBLEMS OF SOCIOLOGY AND HOW THEY ARE HANDLED:
A. Protection of the Weak and the Unfortunate: One of the greatest problems of Sociology is the care of those who are incapable of self support, of whom there are many in every community or nation.
a. Child Welfare: Baby Care 291; Child Training 729; Play and Playgrounds 2832; Child Labor Laws 728; Compulsory Education 1086, 3138.
b. Care of the Old and Disabled: Pensions 2722; Education of the Blind 436; Education of the Deaf 970; Vocational Education of Maimed and Disabled Persons 3653.
c. Care of Paupers, Defectives, and Delinquents: Poor Laws 2878; Eugenics 1187; Juvenile Courts 1906; Prisons and Punishment 2918.
d. The Negro Problem in the United States: **2434.**
—Work of Booker T. Washington: **3674.**
B. Organizations and Institutions for the Preservation of Health and the Relief of Suffering:
a. Public Health Service: **1612.** Quarantine; factory and food inspection; visiting nurses; hospitals.
—Pure Food Laws: 2936.
b. Red Cross: **2983.**
C. Private Philanthropy: Besides the public channels through which social work is carried on, individuals often contribute their personal efforts or their fortunes to the relief of suffering, the advance of education, and to various other causes which are of benefit to humanity.
a. Social Settlements: **3269.** A comparatively recent development in social work is the settlement house, situated in the poorer districts of cities, where educated men and women live that they may come in contact with the poor, improve conditions among them, and give them opportunities for advancement.—Jane Addams and Hull House: 16.

b. **Well Known Philanthropies Having as Their Object Education and Scientific Research:**
   1. Gifts of John D. Rockefeller: 3034—Rockefeller Institute, Rockefeller Foundation, and others.
   2. Andrew Carnegie's Gifts: 646.
   3. Rhodes' Scholarships: 3011.
   4. Nobel Prizes: 2512.

c. **Some Prominent Philanthropists Who Have Labored for Suffering Humanity:**
   1. Florence Nightingale, the greatest of war nurses: 2509.
   2. Clara Barton, another war nurse, who founded the American Red Cross: 337.
   3. Wilfred Grenfell and his work as a medical missionary: 1541.

# Economics

I. **LAND: 1077.** Land is considered the basis of all wealth because it is the source of all the raw materials of production. The share which Land receives from the production of wealth may be measured in terms of **Rent.**
—**The Development of Agriculture and Its Economic Effect: 43, 772.**

II. **LABOR AND CAPITAL: 1077.** The second great factor in the production of wealth is Labor, and Labor's share of wealth is measured in **Wages.** The third element is Capital, or accumulated wealth from which its owner expects to derive an income; its share of wealth is measured in **Interest.**
   A. **Division of Labor: 1076, 43.**
   B. **Enforced Labor—Slavery and Serfdom: 3248.**
   C. **Industrial Revolution and the Factory System: 1778, 1218.**
   D. **Organization of Labor: 1947.**
      a. **Medieval Gilds, Forerunners of Modern Labor Unions: 1459.**
      b. **Gompers and the American Federation of Labor: 1487, 1947.**
      c. **Use of Boycott by Labor Unions: 476.**
      d. **Race Problem in the United States: 2434.**
   E. **Labor Legislation:**
      a. **Factory Laws: 1218.**
      b. **Child Labor Laws: 728.**
      c. **Employers' Liability: 1145.**
   F. **Arbitration and the Labor Problem: 172.**
   G. **Sweatshop System: 3400.**
   H. **Socialism and Labor: 3268, 2156.**

III. **MANAGEMENT AND THE ENTREPRENEUR: 1077.** The last agency in the production of wealth is the "man of enterprise," or manager through whose efforts Land, Labor, and Capital are brought together and put to productive use.

IV. **FINANCE:** The work of obtaining and using money and credit for the support of public and private enterprises.
   A. **Money: 2281.** Origin and Nature of Money: Bimetallism; the Gold Standard; Paper Money; "Quantity Theory"; Making Money.
   B. **Credit and Banking: 917, 327.**
      a. **Building and Loan Associations and Other Types of Coöperative Banks: 528, 879.**
      b. **Federal Reserve System: 1230, 328, 3746.**
      c. **Farm Loan Banks: 1224, 328.**
      d. **Trusts and Trust Companies: 3546.**
      e. **Postal Savings Banks and Postal Money Orders: 2894.**
      f. **Stocks and Bonds: 3358.**
      g. **Promissory Notes: 2725.**
      h. **Banknotes: 2282.**
      i. **Interest: 2724.**
      j. **Bankruptcy: 326.**
   C. **Public Finance:**
      a. **Taxation: 3440.**
         1. Tariff and free trade: 3437.
         2. Stamp duties: 3337.
         3. Income and inheritance taxes: 1741, 3441.
         4. Licenses and excises: 3441.
         5. Single tax: 3442.
      b. **National Debt: 2399.**

V. **PRODUCTION AND DISTRIBUTION:**
   A. **Organizations for Production and Their Regulation:**
      a. **Corporations and Partnerships: 893.**
      b. **Trusts: 3545.**
      c. **Coöperative Societies: 879.**
      d. **Federal Trade Commission: 1230.**
      e. **Public Utilities: 2932.**
      f. **The Question of Government Ownership: 2932.**

B. Commerce and Transportation: **852, 3524.**
   a. Railroads: **2962.**
   b. Postoffice: **2893.**
   c. Ships: **3207.**
   d. Interstate Commerce Commission: **1794.**
   e. Embargoes: **1140.**
C. Boards of Trade: **440.**
D. Conservation: **869.**

VI. INSURANCE: **1791.**

# Political Science (Civics)

I. **ORIGIN OF GOVERNMENT:** If man were a solitary creature who did not come in contact with his fellows, he might do as he pleased without any restraint unless by the law of nature. But man early learned that it was to his advantage to live and work with his fellow men, and found himself better able to survive and make progress in society than out of it. And so his liberty became limited by such rules as were necessary for the public good. The original social unit seems to have been the family, from which developed the clan or tribe, giving rise to the tribal or patriarchal form of government (1223). By gradual evolution this early system gave place to the complex organization now known as the state, a term used primarily to designate any community having an independent existence and possessing a sovereign government (3346). Government, then, is the machinery by which a state makes or enforces the rules of action which are necessary to enable men to live together in peace and security.

II. **FORMS OF GOVERNMENT:**

A. **Monarchy:** A government in which the sovereign authority is vested in one person, called a Sovereign, Monarch, King, Emperor, etc., while those under his rule are called his Subjects; it is usually hereditary, but may be elective. Monarchies are divided into two classes:
   a. **Absolute Monarchy:** One in which the ruler's power is unlimited by any principles of government; it is sometimes called an autocracy, and if the rule is cruel or severe, a despotism or tyranny. Absolute monarchies are now rare. The nearest approach to them survives in such states as Afghanistan and Abyssinia.
   b. **Limited Monarchy:** One in which the ruler is limited in the exercise of his power by a constitution; it is also called a constitutional monarchy. Spain (3306) and Italy (1838) are examples, as is also Great Britain, where the ruler, though theoretically possessing sovereign power, is in fact so limited by the constitution as to make the government practically a democracy (1161, 1153).
      — **Feudal System: 1235.** Under this system which has flourished in various countries at various periods, the King was the nominal owner of all the land. It was distributed, however, as "fiefs" among his Vassals, who owed him in return homage and military aid in time of need. These royal Vassals in turn distributed their land in smaller fiefs to lesser Vassals, and so on down. Each Vassal was, in theory at least, the absolute ruler of his domain, and often became more powerful than the Overlord or even than the King himself.

B. **Aristocracy:** A State ruled by a few nobles; literally the name means "rule of the best," and the ideal aristocracy was controlled by a few men of superior wisdom, who ruled conscientiously in the interest of the people; when those who held the power did so, not by virtue of character, but by virtue of birth or wealth, and allowed their own selfish interests to predominate, the Aristocracy became an **Oligarchy.** This type of government no longer exists, but Rome was so ruled before the empire (3046), and in modern history, the so-called Republic of Venice (3625), which terminated at the close of the 18th century, was another good example.

C. **Democracy:** A government in which all the members of the state possess an equal share of the sovereignty. Democracies may be of two kinds:
   a. **Pure Democracy:** One in which the government is carried on directly by all the people of a community. This form is impossible in large and thickly populated states and is now found only among savage tribes and as a form of local government in small towns.
   b. **Representative Democracy, Republic, or Commonwealth:** One in which the government is delegated to a body of men, elected by the members of the state or **Citizens** (768) as they are called. The United States government is a representative democracy.

D. **Other Political Forms and Doctrines:** Under the name of **Socialism** or **Communism** (3268) are included those plans of government in which the state owns and controls for the equal benefit of every citizen all essential industries and means of distribution. The Bolshevist or Soviet government of Russia is the only large-scale test of Socialism which has been made (450, 3095). The doctrine of **Anarchism** (3269) demands the complete abolition of the state as it exists today, substituting instead some form of industrial cooperation in which, according to the supporters of this doctrine, the common interest of all in the success of each enterprise would make governmental control and regulation unnecessary.

**Note:** A government may be single or **unitary,** that is it may consist of a single state in which there is single sovereignty, or it may be **federal,** consisting of a union of states which have surrendered their right to act independently in matters pertaining to the common interest, while in other respects they have retained complete independence. The United States has a federal government, while France, for instance, has a unitary government.

III. **CONSTITUTIONS:** With the wane of absolute monarchics and the growing tendency toward democracy, the authority of rulers came to be limited or defined by Constitutions. While constitutional government is of comparatively modern origin, the idea it involves—that of agreement between ruler and people, or among the people themselves—is very ancient. The first such agreement in England took the form of a charter, the famous Magna Carta, granted to the English barons in 1215 by King John (2121). Other historic documents of the kind are the English Bill of Rights (393), several provisions of which are found almost word for word in amendments to the United States Constitution; and the constitution prepared by the French Assembly at the time of the Revolution, which contained the immortal "Declaration of the Rights of Man" (1368, 393). Every democracy has a constitution as its basis of government. It may be either written or unwritten. Read the article on the drafting and provisions of the **United States Constitution** (3592).

IV. **FUNCTIONS OF GOVERNMENT:** A government, no matter what its form may be, has three functions, known as **Legislative, Judicial,** and **Executive.**

V. **LEGISLATIVE BRANCH:** The function of the legislative department of a government is to make the laws. In the United States the legislative branch is sharply separated from the executive branch of the government, but in countries like England, which have the parliamentary form of government, the line is not so clearly drawn.

- A. **Laws and Law Making: 1972.**
  — **Justinian and the Roman Civil Law 1905; the Code Napoleon 2394-5.**
- B. **British Parliament: 2687.** The law-making body for the British Empire and the oldest legislative assembly in existence.
  —**Cabinet: 555.** Note the important part the British cabinet takes in the proceedings of Parliament, as opposed to the functions of the United States cabinet which are purely administrative. This is a distinguishing feature of "parliamentary" governments.
- C. **United States Congress: 3593, 860.** The Senate and the House of Reprcsentatives, the two bodies which constitute the law-making organization of the United States government; how they are elected; their powers; the machinery for making a law.
  - a. **The Vice-President, the Presiding Officer of the Senate: 3637.**
  - b. **Some Specific Powers of Congress:**
    1. Impeachment: 1740. In using this power Congress acts in a judicial capacity.
    2. Establishing a system of weights and measures: 3714.
    3. In Treaty-making: 3529.
    4. In establishing bankruptcy laws: 326.
    5. Extra-territorial powers: 3601.
  - c. **Duties in Election of President: 2914.**
  - d. **Citizenship and Naturalization Laws: 768, 2405.**
  - e. **Patent and Copyright Laws: 2692, 884.**

VI. **EXECUTIVE BRANCH:** That branch of government which administers and enforces the laws. We may take the executive organization of the United States Government and its duties as an example (3695).

- A. **The President: 2913, 3594.** The chief executive of the United States; necessary qualifications for office; manner of election; his powers and duties.
  - a. **Relations with Congress: 2914, 860.**
  - b. **Veto Power: 3636.**
  - c. **Treaty-Making Power: 3529.**
- B. **The Vice-President: 3636.** Since the Vice-President's chief duty is to preside over the Senate, he is associated more properly with the Legislative than the Executive Branch.
- C. **The Cabinet: 555.** The President's advisers and heads of the ten great executive departments
- D. **The Executive Departments: 3596.**
  - a. **State Department—Organization and Duties: 3596, 3597.**
    1. Diplomatic and Consular Service: 1012, 852.
    2. Granting of Passports: 2691.
  - b. **Treasury Department—Its Branches and Duties: 3598, 3597.**
    1. Mints and Coinage: 2258, 2281.
    2. Bureau of Engraving and Printing: 2284.
    3. Farm Loan Board: 1224.
    4. Coast Guard (including Life-Saving Service and Revenue Cutter Service): 1995.
    5. Public Health Service: 1612.
  - c. **War and Navy Departments: 3598, 3597.**
    1. Organization of United States Army: 217, 2236.
    2. Organization of United States Navy: 2426, 2418.
  - d. **Postoffice Department: 2893, 3599, 3597.**
  - e. **Department of Commerce and Its Varied Duties: 3599, 3597.**
    1. Bureau of Lighthouses: 2006.
    2. The Bureau of Census: 676.
    3. The Bureau of Fisheries: 1280, 1282.
  - f. **Department of Agriculture and Its Functions: 3600, 3597.**
    1. Weather Bureau: 3707.
    2. Bureau of Public Roads: 3026.
    3. Forest Service: 1331, 1329.

g. Department of Labor: **3600, 3597.**
h. Department of the Interior: **3600, 3597.**
1. General Land Office: 1960.
2. Office of Indian Affairs: 1774.
3. Bureau of Pensions: 2722.
4. Patent Office: 2694, 884.
5. Bureau of Education: 1086, 77.
6. Reclamation Service: 1829.
7. Bureau of Mines: 2251.
8. National Park Service: 2399.
i. Department of Justice: **3601, 3597.**

E. Civil Service: **774.**
F. Independent Executive Branches: Besides the ten departments there are various independent Commissions and Bureaus which belong to the Executive Branch of the Government, such as the **Government Printing Office 3601; Civil Service Commission 776; Interstate Commerce Commission 1794; Federal Reserve Board 1230.**

VII. JUDICIAL BRANCH: The branch which applies and interprets the laws.
A. Courts of Justice: **909.** Their criminal and civil functions; different classes of courts.
a. Habeas Corpus: **1557.**
b. Jury Trials: **1903.**
c. Prisons and Punishments: **2918.**
d. Juvenile Courts: **1906.**
B. The Judiciary of the United States Government: **909, 3594, 2155.** The United States Supreme Court and its jurisdiction; inferior courts; courts martial.
C. The British Court System: **909.**

VIII. TAXATION: **3440.** How a government obtains money to conduct its affairs; how a tax is levied; different kinds of taxes.

IX. STATE GOVERNMENT IN THE UNITED STATES: **3346.** Besides the elaborate machinery that goes to make up the Federal Government, each State has an independent organization limited only by the Federal Constitution.
A. Relations between the State and Federal Governments:
a. States' Rights: **3347.**
b. Powers Given the States by the Federal Constitution: **3593.**
c. Power of United States Supreme Court over State Laws: **3594.**
B. Bill of Rights: **393.** The portion of a State Constitution which defines the rights of the individual.
C. Important Departments and Functions of State Government:
a. State Courts: **909.**
b. State Health Department: **1612.**
c. State Constabularies: **2866.**
d. Control of Public Education: **1086, 830, 3142.**
e. Control of Corporations: **893.**
f. Public Utilities Controlled by the State: **2932.**

X. LOCAL GOVERNMENTS IN THE UNITED STATES:
A. The County and Its Organization: **906.**
B. Township or Town Government: **3521, 3008.** A government unit that survives from the days of the Puritan Fathers and is still a political entity in some states.
C. Municipal Government: **2370.** Village and city charters; how the government is organized; different types of city government.
a. Relations between the City and the State: **770.**
b. Important Departments:
1. Fire Department: 1257.
2. Health Department: 1612.
3. Police Department: 2865.
4. Police or Municipal Courts: 909.
c. Regulation of Public Utilities: **2932.**
d. Borough System of Government in New York City: **2498.**

XI. POLITICAL PARTIES AND ELECTIONS:
A. Political Parties: **2869.** The origin and necessity of parties in the governments of free peoples.
B Suffrage: **3384.**
—Woman Suffrage: **3777.**
C. Elections: **1107.**
a. Voting by Ballot: **320.**
b. Primary Elections in the United States: **2915.**
D. Initiative, Referendum, and Recall: **1778.**

XII. INTERNATIONAL LAW: **1794.**
A. Treaties: **3529.**
a. Naturalization Treaties: 2405.
b. International Postal Union: 2898.

B. Arbitration of Disputes: **172.**
C. Extra-Territorial Rights of Diplomatic Representatives: **1013.**
D. Some Rules of War: **1794.**
   a. Blockade: **437.**
   b. Embargo Acts: **1140.**
   c. Privateering and Letters of Marque: **2810.**
   d. Armistice and Truce: **213.**
E. Hague Peace Conferences: **1559.**
F. League of Nations: **1974.**

# Education

Note: This Outline is intended only as a brief survey of the principal articles on educational subjects. A full discussion of the modern educational movements and of educational theory from the point of view of American schools will be found in the Outline devoted to the Problem Project Method and allied topics.

I. PSYCHOLOGY AND ITS IMPORTANCE IN EDUCATION: **2930.**
   A. The Mind Defined: **2247.**
   B. Apperception and Its Relation to Methods of Learning: **158.**
   C. Memory—What It is and How It May Be Improved: **2197.**
   D. Habits and How They are Formed: **1557.**
   E. Adolescence: **25.** How the intellect is affected by the period of transition from childhood to adult life.
   F. Intelligence Tests as a Guide to Ability: **1793.**

II. SOME SPECIAL EDUCATIONAL THEORIES AND METHODS:
   A. The Training of Young Children: **729.**
      a. Froebel and the Kindergarten: **1923, 1372.**
      b. Montessori Method: **2313.**
      c. Importance of Play: **2832.**
   B. Vocational Education: **3653.**
   C. The Gary School Plan: **1401.**
   D. Methods of Educating the Blind and Deaf: **436, 970.**
   E. Athletics as a Part of the Education of Youth: **251.**
   F. The Use of Motion Pictures as a Means of Instruction: **2342.**
   G. Story Telling as an Aid to Education: **3367.**
   H. Methods of Study: **3372.**
      a. The Study of Grammar as a Basis for Correct Thinking: **1495.**
      b. Mind Training Through Reading: **2979.**
      c. School Gardens as an Aid to Various Branches of Study: **3142.**

III. EDUCATIONAL AGENCIES:
   A. School Systems in the United States and Other Countries: **3138.** Classes of schools; vacation schools; commercial and industrial schools; continuation schools; some important educational problems in the United States.
      a. History of Public Education in the United States: **1084.**
      b. Some Special Types of School in the United States:
         1. Vocational schools and classes: 3655.
         2. Schools for the blind and for the deaf: 437, 970.
         3. Schools for negroes: 2434, 73.
   B. Colleges and Universities: **827.** Courses of study; value of a college education; requirements for entrance; classes of colleges in the United States; junior colleges; extension departments; the development of the university; important universities of Europe, Canada, and the United States.
   C. Auxiliary Institutions and Organizations for Educational Purposes:
      a. Libraries and How To Use Them: **1991.**
      b. The Chautauqua Movement: **707.**
      c. Social Settlements: **3269.**
      d. Boy Scouts, Girl Scouts, and Camp Fire Girls: **479, 1464, 592.**

# Social Science Books for Young Readers

Around the World with the Children. F. G. Carpenter.
Home Life Around the World. George A. Mirick.
Curiosities of Popular Customs. W. S. Walsh.
How Other People Live. H. C. Barnard.
Cave, Mound, and Lake Dwellers. Florence Holbrook.
Romance of Savage Life. G. F. Scott Elliot.
Strange Peoples. Frederick Starr.
Short History of Coins and Currency. Sir John Lubbock.
Uncle Sam's Business. Crittenden Marriott.
Uncle Sam's Modern Miracles. William A. Du Puy.
The Friendship of Nations. Lucile Gulliver.
Politics for Young Americans. Charles Nordhoff.
What to Do for Uncle Sam. Carolyn Sherwin Bailey.
Course in Citizenship. Mrs. Ella Cabot.
The American Citizen. C. F. Dole.
The Progress of a United People. C. L. Barstow.
Lessons for Junior Citizens. Mabel Hill.
Among the Law-Makers. Edmund Alton.
Century Book for Young Americans. E. S. Brooks.
How the Republic is Governed. Noah Brooks.
How the People Rule. Charles De Forest Hoxie.
Elements of Civil Government. W. A. Mowry.
Nation and State. G. M. Philips.
Young Citizen's Reader. Paul S. Reinsch.

*consult the Easy Reference Fact-Index at the end of this work*

# Social Science Books for Older Readers

## SOCIOLOGY

**Introduction to the Study of Sociology.** E. C. Hayes.
**The Elements of Sociology.** F. H. Giddings.
**An Introduction to the Study of Society.** A. W. Small and G. E. Vincent.
**The Mind of Primitive Man.** Franz Boas.
**Biological Aspects of Human Problems.** C. A. Herter.
**Primitive Culture.** E. B. Tylor.
**Men of the Old Stone Age.** Henry Fairfield Osborn.
**Ethnology.** A. H. Kean.
**Prehistoric Man and His Story.** G. F. Scott Elliot.
**Savage Survivals.** J. Howard Moore.
**Ancient Law, Its Connection with the Early History of Society and Its Relation to Modern Ideas.** Sir Henry Mayne.
**The Golden Bough.** J. G. Frazer.
**The History of Social Development.** F. Müller-Lyer.
**Ancient Society.** Lewis H. Morgan.
**Influences of Geographic Environment.** Ellen Churchill Semple.
**The Material Culture and Social Institutions of the Simpler Peoples.** L. T. Hobhouse.
**Primitive Society.** Robert H. Lowie.
**Origin of Civilization and the Primitive Condition of Man.** Sir John Lubbock.
**Social Origins and Primal Law.** Andrew Lang and J. J. Atkinson.
**The Development of Western Civilization.** J. D. Forrest.
**The Anatomy of Society.** Gilbert Cannan.
**Principles of Sociology.** Herbert Spencer.
**Theory of Social Forces.** S. N. Patten.
**Social Control.** E. A. Ross.
**Sociology: Its Simpler Teachings and Applications.** James Q. Dealey.
**Sociology and Modern Social Problems.** C. A. Ellwood.
**An Introduction to Social Psychology.** C. A. Ellwood.
**Social Evolution and Political Theory.** L. T. Hobhouse.
**Theories of Social Progress.** A. J. Todd.
**Individual and Society; or Psychology and Sociology.** J. M. Baldwin.
**Sociology Applied to Practical Politics.** J. B. Crozier.
**The Meaning of Soc'al Science.** A. W. Small.
**Social Institutions.** D. J. Snider.
**Applied Sociology.** L. F. Ward.
**Evolution and Ethics.** T. H. Huxley.
**Democracy and Social Ethics.** Jane Addams.
**Social Environment.** George R. Davies.
**A History of the Family as a Social and Educational Institution.** Willystine Goodsell.
**The Spirit of Youth and the City Streets.** Jane Addams.
**The State and the Child.** W. Clarke Hall.
**Parents and Their Problems.** Mary Harmon Weeks.
**Outlines of Child Study.** William A. McKeever.
**The Origins of Popular Superstitions and Customs.** T. S. Knowlson.
**Holiday Facts and Fancies.** C. J. Denton.

**Note:** Additional books dealing with many practical phases of Sociology will be found with the Outlines on Geography and Home Economics.

## ECONOMICS

**Wealth of Nations.** Adam Smith.
**Principles of Political Economy and Taxation.** David Ricardo.
**Principles of Political Economy.** T. R. Malthus.
**Principles of Political Economy.** J. S. Mill.
**Principles of Political Economy.** Henry Sidgwick.
**Capital: A Critique of Political Economy.** Karl Marx.
**Outlines of Economics.** R. T. Ely.
**Progress and Poverty.** Henry George.
**Elementary Principles of Economics.** Irving Fisher.
**Philosophy of the Practical.** Benedetto Croce.
**Principles of Economics.** E. R. A. Seligman.
**Taxation and the Distribution of Wealth.** Frederick Mathews.
**Principles of Economics.** F. W. Taussig.
**History of Economic Thought.** L. H. Haney.
**Value and Distribution.** H. J. Davenport.
**Labor Problems.** T. S. Adams and H. L. Sumner.
**Economic History of United States.** E. L. Bogartt.
**Tariff History of United States.** F. W. Taussig.
**Introduction to Public Finance.** C. C. Plehn.
**Money and the Mechanism of Exchange.** W. S. Jevons.
**The Rate of Interest.** Irving Fisher.
**The Principles of Money and Banking.** C. A. Conant.
**Money, Banking, and Finance.** A. S. Bolles.
**The Value of Money.** Benjamin M. Anderson.
**Commercial Paper; a Text Book for Merchants, Bankers, and Investors.** Roger W. Babson and Ralph May.
**The Practical Work of a Bank.** W. H. Kniffin.
**Foreign Exchange Explained.** Franklin Escher.
**The Elements of Insurance.** J. A. Eke.
**Insurance Science and Economics.** F. L. Hoffman.
**Principles of Insurance.** W. F. Gephart.
**Insurance and the State.** W. F. Gephart.
**Labor, Management, and Production.** Compiled by the American Academy of Political and Social Science.
**Trade Unionism and Labor Problems.** J. R. Commons.
**The Financial Organization of Society.** H. G. Moulton.
**Banking Practice.** L. H. Langston and N. R. Whitney.
**The Stock Exchange.** F. W. Hirst.
**The Evolution of Industry.** D. H. Macgregor.
**The Factory.** J. T. Lincoln.
**Capitalization; a Book on Corporation Finance.** W. H. Lyon.
**Organizing a Business.** Maurice H. Robinson.
**Business a Profession.** Louis D. Brandeis.
**Trusts, Pools, and Corporations.** W. Z. Ripley.
**Money and Prices.** J. Laurence Laughlin.
**Coöperation and the Future of Industry.** Leonard S. Woolf.
**Profit-Sharing; Its Principles and Practice.** Boris Emmet.
**The Conditions of Labor in the American Industries.** W. J Lauk and Edgar Sydenstriker.
**Economic History of the United States.** E. L. Bogart.
**Elements of Commercial Law.** A. H. Douglas.

## POLITICAL SCIENCE

**The Spirit of Laws** Montesquieu.
**Plato's Republic.**
**The Social Contract.** Rousseau.
**The Political Theories of the Ancient World.** W. W. Willoughby.
**Theory of the State.** J. K. Bluntschli.
**Elements of Politics.** Henry Sidgwick.
**Introduction to the History of the Science of Politics.** Sir Frederick Pollock.
**History of American Political Theories.** C. E. Merriam.
**Problems in Political Evolution.** R. G. Gettell.
**The Citizen.** N. S. Shaler.
**The Promised Land.** Mary Antin.
**New Civics.** R. L. Ashley.
**American Citizenship.** C. A. and M. R. Beard.
**The Constitution and What It Means Today.** Edward S. Corwin.
**Immigration and Americanization.** Philip Davis and Bertha Schwartz.
**Organized Self-Government.** Edgar Dawson.
**Advanced Civics.** S. E. Forman.
**Undercurrents in American Politics.** A. T. Hadley.
**Community Civics.** R. O. Hughes.
**Conservative Democracy.** Paul Kester.
**The American Commonwealth.** James Bryce.
**Modern Democracies.** James Bryce.
**Governments and Parties in Continental Europe.** A. L. Lowell.
**The Initiative, Referendum, and Recall in America.** E. P. Oberholtzer.
**American Legislation and Legislative Methods.** Paul S. Reinsch.
**The Rights and Duties of American Citizenship.** W. W. Willoughby.
**Popular Law-Making.** F. J. Stimpson.
**Parliamentary Law and Practice.** L. S. Cushing.
**Local Government in Counties, Towns, and Villages.** J. A. Fairlie.
**The Government of American Cities.** W. B. Munro.
**The Government of European Cities.** W B. Munro.
**Police Administration.** L. F. Fuld.
**Law and Its Administration.** Harlan F. Stone.
**The American Judiciary.** S. E. Baldwin.
**Treatise on Criminal Law and Criminal Procedure.** C. E. Chadman.
**Juvenile Courts.** Stanley K. Hornbeck.
**International Law.** Berthold Singer.
**International Law.** G. G. Wilson and G. F. Tucker.
**A Guide to Diplomatic Practice.** Sir Ernest Satow.

## EDUCATION AND PSYCHOLOGY

**A General Introduction to Psycho-Analysis.** Sigmund Freud.
**Psychology of the Unconscious.** Carl Gustav Jung.
**The Theory of Psycho-Analysis.** Carl Gustav Jung.
**Psycho-Analysis and Behavior.** André Tridon.
**Psycho-Analysis, Sleep, and Dreams.** André Tridon.
**An Introduction to Social Psychology.** Charles Abram Ellwood.
**Mind in the Making.** Edgar J. Swift.
**Memory.** Hermann Ebbinghaus.
**Educational Psychology.** Edward L. Thorndike.
**Talks to Teachers on Psychology and to Students on Some of Life's Ideals.** William James.

Principles of Psychology. William James.
How We Think. John Dewey.
Psychology of the Common Branches. Frank N. Freeman.
The Child's Unconscious Mind. Wilfrid Lay.
Character Training in Childhood. Mary S. Haviland.
The Psychology of Adolescence. Frederick Tracy.
The Intelligence of School Children. Lewis M. Terman.
Methods and Results of Testing School Children. Dewey, Evelyn, and Others.
Educational Tests and Measurements. Monroe, DeVoss, and Kelley.
Mentally Defective Children. Binet and Simon.
History of Education. Paul Monroe.
A History of Education During the Middle Ages and the Transition to Modern Times. F. P. Graves.
The Educative Process. William C. Bagley.
Emile, or Concerning Education. Jean-Jacques Rousseau.
Democracy and Education. John Dewey.
Changing Conceptions of Education. E. P. Cubberley.
American Education. A. S. Draper.
The Child and the Curriculum. G. Stanley Hall.
Youth; Its Education, Regimen, and Hygiene. Paul H. Hanus.
History of Common School Education. L. F. Anderson.
The School. J. J. Findlay.
Jean-Jacques Rousseau and Education from Nature. Gabriel Compayré.
The Education of Man. Friedrich W. A. Fröbel.
The Montessori Method. Maria Montessori.
Montessori Methods in a Large Infants' School. Mary Blackburn.
Learning to Earn. John A. Lapp and Carl H. Mote.
Introduction to Vocational Education. David Spence Hill.
The Vocational Guidance Movement, Its Problems and Possibilities. John M. Brewer.
Educational Extension. Clarence Arthur Perry.
The Principles and Practice of Continuation Teaching. Charles H. Kirton.
Business and Education. Frank A. Vanderlip.
The Junior High School. Leonard V. Koos.
Present Standards of Higher Education in the United States. G. E. MacLean.
College Entrance Requirements. C. D. Kingsley.
The Story of Chautauqua. Jesse Lyman Hurlbut.
Motion Picture Education. Ernest A. Dench.
Teaching Citizenship Via the Movies. Ina Clement.
How to Tell Stories to Children. S. C. Bryant.

# HOME ECONOMICS

THE study of Home Economics, which deals with the natural, economic, and social foundations of home-life, has come to have an important place in general education. The four main topics of which it treats are shelter, food, clothing, and home management. The article on Home Economics (1675) tells something of the scope of the subject as it is taught in the schools. In this Outline there are gathered together the chief articles and portions of articles which will be of assistance to anyone interested in the art of home-making.

I. THE HOME AND ITS EQUIPMENT:
- A. Heating and Ventilation: **1621, 1715.** Importance of Keeping a House at the Proper Temperature; Different Heating Systems; How to Keep the Air Fresh.
  —Stoves and Fireplaces: **3368.**
- B. Lighting Systems: **1958.**
  - a. Electric Lighting: **1123.**
  - b. Gas Lighting: **1406.**
  - c. Acetylene Lighting: **7.**
  - d. Gas and Electric Meters: **2204.**
- C. Plumbing and Sewerage: **2840, 3182, 1715.**
  —Water Meters: **2206.**
- D. Locks and Keys: **2042.**
- E. Furnishings and Decoration:
  - a. Wall Coverings: Wall Paper **3665**; Tapestry **3433.**
  - b. Rugs and Carpets: **3077.**
  - c. Furniture: **1383.** Veneer 3620.
  - d. Baskets and Pottery: **341, 2903.**
  - e. Paints and Varnishes: **2642.**
- F. Electrical Labor-Saving Devices: **1114.**

II. SANITATION, VENTILATION, AND HYGIENE:
- A. Keeping the Home in Sanitary Condition: **1715.** House Cleaning; Care of Food; Keeping the Drinking Water Pure; Heat and Ventilation.
  - a. Insect Pests and How to Destroy Them: Flies 1312; Cockroaches 817; Fleas 1292.
  - b. Mice and Rats: **2359, 2978.**
  - c. Fumigation and Disinfectants: **151, 1331.**
  - d. Mildews and Molds and How to Avoid Them: **2235.**
- B. Personal Hygiene:
  - a. How to Keep Fit: **1713.**
  - b. First Aid: **1266.** What to Do Till the Doctor Comes; Treatment of Common Mishaps; What to Keep in a First Aid Box.
- C. Fire Prevention: **1260.**

III. FOOD: **1320.**
- A. Food Materials:
  - a. Carbohydrates: Starches **3344**; Sugars and Their Food Value **3388.**
  - b. Fats: **1225.**
  - c. Proteins: **2926.**
  - d. Mineral Salts—How They are Absorbed by Plants and Passed on to Man: **2824.**
  - e. Vitamins: **3651.**
  - f. Water: **3694.**
- B. Some Important Foods:
  - a. Meat and Meat Packing **2180**; Cuts of Beef **2185.**

b. **Principal Food Fishes: 1278.**
c. **Eggs—Their Value and How to Preserve Them: 2908.**
—Varieties of Eggs Used as Food: 1090.
d. **Milk and Its Products: 2238.** Dairying 949; Cheese 708; Butter 543.
e. **Grain Foods:** Breakfast Cereals 501; Flour 1301; Wheat 3730; Corn and Hominy 890; Barley 330; Rice 3015; Buckwheat 524.
f. **Legumes or "Pod" Foods:** Beans 347; Peas 2698; Lentils 1988; Peanuts 2700.
g. **Root, Bulb, and Tuber Foods:** Radishes 553; Turnips 554; Beets 365; Parsnips 2691; Carrots 650; Onions 2581; Potatoes 2900; Sweet Potatoes 3405.
h. **Leaf and Stalk Foods:** Cabbages and Cauliflower 553; Asparagus 234; Celery 671; Lettuce; Spinach; Rhubarb 3012.
i. **Other Vegetables:** Tomatoes 3512; Cucumbers 939; Pumpkins and Squash 2934, 3333.
j. **Fruits: 1377, 1380; Melons 2195; Nuts 2545.**
k. **Foods Used for Their Taste or Flavor:** Sugar 3385; Maple Sugar 2138; Spices and Condiments 3317; Pepper 2723; Salt 3115.

C. Cooking: **875.** Soups; Meats; Eggs; Cakes; Muffins; Pancakes.
a. **Use of Baking Powder: 305.**
b. **Bread and Baking: 496.**
c. **Candies: 628.**
d. **Camp Cooking: 599.**

D. Preservation of Food: **151.**
a. **Cold Storage and Refrigeration: 825, 2989.**
b. **Dehydration, or the Process of Drying Fruits and Vegetables: 986.**
c. **Canning: 631.**
d. **Pure Food Laws: 2936.**

E. **Some Pointers about Table Setting and Table Manners: 1183.**
—History of the Use of Knives, Forks, and Spoons: 1937.

IV. CLOTHING:
A. **The History of Costume: 897.**
B. Textiles:
a. **Kinds of Cloth: 804.** Cotton 904; Linen 2018, 1291; Silk 3234; Wool 3782.
b. **Spinning, Weaving, and Knitting: 3326, 1935.**
c. **Bleaching and Dyeing: 435, 1049.**

C. How Clothing is Manufactured: **805.**
a. **Hats and Caps: 1597.**
b. **Shoes: 3220.**
c. **Gloves: 1474.**
d. **Buttons: 548.**

D. Sewing and Mending: **3183.**
a. **Sewing Machines and How They Work: 3186.**
b. **Needles and Thread: 2433, 3493.**
c. **Embroidery: 1140.**

E. **How Clothing is Handled in the Modern Laundry: 1969.**

V. CARE OF CHILDREN:
A. Baby Care: **291.**
B. Child Training: **729.**

VI. DOMESTIC PLANTS AND ANIMALS:
A. Gardens and Gardening: **1394.**
a. **What and When to Plant in the Vegetable Garden: 1397.**
b. **Hedges: 1627.**
c. **How to Fight Weeds: 3713.**
Note: For additional information on gardening, read the articles on the various garden flowers and plants.

B. Pets and Their Care: **2755.**
—Birds and Bird Houses: **421.**

VII. HOW TO KEEP HOUSEHOLD ACCOUNTS: **5.**

# Books on Home Economics

## FOR YOUNG READERS

**How the World is Housed.** Frank George Carpenter.
**Home Decoration.** Charles Franklin Warner.
**How to Make Baskets.** Mary White.
**More Baskets and How to Make Them.** Mary White.
**Carpentry and Woodwork.** Edwin W. Foster.
**Health in Home and Town.** Bertha Millard Brown.
**Saturday Mornings or How Margaret Learned to Keep House.** Caroline Benedict Burrell.
**Housekeeping for Little Girls.** Olive Hyde Foster.
**Book of Useful Plants.** Julia Ellen Rogers.
**Little Cook Book for a Little Girl.** Caroline Benedict Burrell.
**When Mother Lets Us Cook.** Constance Johnson.
**Six Little Cooks, or Aunt Jane's Cooking Class.** Elizabeth Stansbury Kirkland.
**Sewing for Little Girls.** Olive Hyde Foster.
**Needlecraft.** Effie Archer.
**When Mother Lets Us Sew.** Virginia Ralston.

**The Little Girl's Sewing Book.** Flora Klickmann.
**When Mother Lets Us Garden.** Frances Duncan.
**Gardening for Little Girls.** Olive Hyde Foster.
**The Book of the Home Garden.** Edith Loring Fullerton.
**Forty Lessons in Gardening.** United States Education Bureau.
**Hints and Helps for Young Gardeners.** Herbert Daniel Hemenway.
**The Pet Book.** Anna Botsford Comstock.
**Bird Houses and How to Build Them.** Ned Dearborn.

### FOR OLDER READERS

**The Home Economics Movement.** Bevier and Usher.
**Syllabus of Home Economics.** American Home Economics Association, Baltimore, Md.
**The Art of Right Living.** E. H. Richards.
**Household Arts for Home and School (2 vols).** Anna M. Cooley and Wilhelmina H. Spohr.
**The Science of Home Making.** Emma E. Pirie.
**1000 Shorter Ways Around the House.** Mae Savell Croy.
**The Home and Its Management.** Mabel Hyde Kittredge.
**The New Interior.** Hazel H. Adler.
**The Practical Book of Interior Decoration.** Horace Donaldson Eberlein and others.
**Color Schemes for the Home and Model Interiors.** Frohne and Jackson.
**Interior Decoration for the Small Home.** Amy L. Rolfe.
**Historic Styles in Furniture.** Virginia Robie.
**Antique Furniture.** Frederick W. Burgess.
**Handbook of Furniture Styles.** Walter A. Dyer.
**Decorative Textiles.** George Leland Hunter.
**Making Curtains and Hangings.** Agnes Foster.
**Old Pottery and Porcelain.** Frederick W. Burgess.
**Letters to a Young Housekeeper.** Jane Prince.
**Food Facts for the Home Maker.** Lucile Stimson Harvey.
**Food and Health.** Helen Kinne and Anna M. Cooley.
**The Planning of Meals.** Isabel Bevier.
**Balanced Meals with Recipes.** Lake View Woman's Club, Chicago.
**Low Cost Cooking.** Florence Nesbitt.
**Home Canning, Drying, and Preserving.** A. Louise Andrea.
**How to Set the Table for Every Occasion.** Sara Swain Adams.
**The Service of Meals.** Nina B. Crigler.
**The Psychology of Dress.** Frank Alvah Parsons.
**Textiles and Costume Design.** Evelyn Peters Ellsworth.
**The Art and Ethics of Dress as Related to Efficiency and Economy.** Eva Olney Farnsworth.
**Clothing and Health.** Helen Kinne and Anna M. Cooley.
**Clothing for Women.** Laura I. Baldt.
**Costume Design and Home Planning.** Estelle Peel Izor.
**A Handbook of Elementary Sewing.** Etta Procter Flagg.
**The Health Care of the Growing Child.** Louis Fischer.
**Infancy and Childhood.** Walter Reeve Ramsey.
**The Care and Feeding of Children.** Emmett Holt, M.D.
**The Care of the Baby.** J. P. C. Griffith, M.D.
**Around the Year in the Garden.** Frederick F. Rockwell.
**Studies in Gardening.** Arthur Clutton Brock.
**House Plants.** Hugh Findlay.
**Continuous Bloom in America.** Louise Shelton.
**The Backyard Garden.** Edward I. Farrington.
**Practical Gardening.** Hugh Findlay.
**Pets.** Lee S. Crandall.

**Note:** Many additional books on handicrafts and similar topics of interest to home-makers, young and old, will be found with the Outline on Industries and Applied Science.

# Picture Story of Dress

**The Rude Garments of Our Cavemen Ancestors 666-7.**
**Simple Dress of the Egyptians 1101-2.**
**Assyrian Soldier in Armored Mail 296.**
**The Classic Costumes of the Greeks and Romans 1526, 1516, 3542, 3041.**
**Byzantine Ladies in Court Costume 2630.**
**Royal Robes of England's Rulers 1429.**
**Uniform of the London Policeman 2053.**
**Gipsy Children 1463.**
**A Scotch Highlander in Plaid and Bonnet 3146.**
**The Frock of an Irish Lass 1807.**
**Costumes of Rural France 1347-50.**
**A Belgian Milkmaid 374.**
**The Suit of a Swiss Boy 1476.**
**Costume of a Swiss Peasant 3413.**
**Dress in the Land of the Dutch 2439.**
**Rich Costumes of Dutch Royalty 2636.**
**Quaint Costumes of Bavaria 346.**
**Danish Peasant Dress 994.**
**The Costumes of Old and Young Icelanders 1723-4.**
**National Dress of the Swedes 3402.**
**Some Styles Seen in Norway 2530-5.**
**Dress of the Polish Peasants 2856-8.**
**A Rumanian Working Woman 3081.**
**A Rumanian Bridal Dress 3082.**
**Holiday Dress of the Rumanian Peasant 273.**
**The Royal Apparel of a Young Spanish Prince 2636.**
**Street Dancers of Granada in Their Spanish Frocks 3299.**
**Gorgeous Trappings of the Spanish Matador 3305.**
**The Suit of a Spanish Workman 3300.**
**Portuguese Housewives 2889.**
**Italian Costumes 1838-41.**
**Fashions in the Balkans 309, 1902.**
**Types of Russian Dress 3085-9.**
**A Russian Coachman in His Padded Livery 2748.**
**Egyptian Water Carriers 1093, 566.**
**Garments of an African Arab 1685.**
**Moslem Dress 2328.**
**Court Costumes of Abyssinia 3.**
**Ceremonial Dress of East Africans 1068.**
**African Royal Dress 33.**
**African Styles 35, 38.**
**Garments of the Zulus 3280-3.**
**Simple Dress Worn by the Natives of Madagascar 2105.**
**Four Types of Asiatic Dress 227.**
**Kimonos of the Japanese 1862-75.**
**Korean Clothes 1942.**
**Chinese Costumes 742-51, 638, 2708.**
**The Heavy Garments of the Tibetans 3496, 231.**
**Gown of a Siamese Dancer 3227.**
**Native Dress in the Malay Peninsula 2129-31.**
**Singapore Workmen 2723.**
**Varied Styles of India 1746-52, 1756.**
**Curious Persian Costumes 2734-5.**
**Modern Styles of Arabia 166.**
**White-Clad Arab Worshipers 2275.**
**Armenian Dress 212.**
**Syrian Styles 955-6, 3425.**
**Turkish Costumes 3558-60.**
**Odd Costumes Seen on the Shores of the Tigris 2200.**
**Jewish Costumes of Jerusalem 1886.**
**Official Dress in Java 1879.**
**Dress in the Philippines 2765-9.**
**Garments of Spice Workers 3318.**
**Native Dress in New Guinea 2451.**
**The "Full Dress" of a Native Australian 262.**
**New Zealand Styles 2499.**
**Fashions of the South Seas 2618-24, 819.**
**Hawaiian Dress 3386.**
**Costumes of the Greenlanders 1539.**
**The Navajo Indians and Their Blankets 206.**
**Typical Dress of the Pueblo Indians 2933.**
**Costumes of the American Indians 1765-70.**
**Some Native Mexicans 2209-15.**
**Garments of Jamaica 1860.**
**Costumes Seen in the Streets of Haiti 1561.**
**Dress of the Peruvian Forest 2741.**
**Various Styles of South America 3287.**
**Our Puritan Ancestors Dressed for Church 2937.**
**Uniforms of the Revolutionary War 3000-3.**
**The Blue and the Gray of the Civil War 776-8.**
**Civil War Uniforms of the Federal Generals 2015.**
**Uniform of the United States Soldier 217.**
**The American Sailor in Uniform 2425, 3378.**
**American Army and Navy Uniforms and Insignia 3576-7.**
**Modern Fireman's Uniform and Equipment 1260.**
**Dress in Eskimo Land 1176-7.**
**Warm Garments of the Polar Explorers 120, 2862, 2704.**
**Various Uniforms and Equipment of the World War Soldiers 3781-3809.**
**Uniform of a Belgian Sentry in the World War 3790.**
**French Marshal's Uniform 1315.**
**Evolution of Dress 897-900.**
**Styles in Armor 215.**
**Monastic Dress 2298-2302.**
**Police Uniforms in Many Lands 2865-8.**
**Postmen's Uniforms in Various Parts of the World 2892-4.**
**Fashions in Diving Clothes 1014, 2782.**
**Boy Scout's Uniform 479-483.**
**Ceremonial Dress of the Camp Fire Girl 592.**

# Picture Story of Houses

A Reconstructed House from the Ruins of Pompeii 2877.
Plan of a Medieval European Castle 655.
A Farm House in the Hills of Norway 2533.
A Typical English Thatched Cottage 1155.
Old Timbered Houses of Chester, England 1157.
An Irish Peasant's Cottage 1808.
Cottages of the Scottish Villager 2345.
A German Peasant's Cottage in the Black Forest 1439.
Goethe's Birthplace, Frankfort-on-the-Main 1478.
A Typical Hungarian Farm House 1703.
Peasant Home, Austria-Hungary 272.
A Peasant's House in the Portuguese Mountains 2891.
Some Dwellings in the Balkans 309.
The Thatched Hut of a Caucasus Peasant Family 3087.
Mushroom Huts of South Africa 38.
A "Walled City" in British East Africa 37.
Beehive Huts in Zululand 3280.
Simple Cottages of Remote Siberia 3228.
Hat-Like Dwellings of Korea 1943.
Stone Houses of the Hill Tribes of India 1650.
Indian House on the Slopes of the Himalayas 1745.
Picturesque Houses of Modern India 1746.
Chinese Life in Walls of Mud 745.
The Famous Tile Roofs of China 743.
Modern Chinese Houses Show European Influence 750.
The American Consulate at Mukden, China 747.
Village Homes in Siam 3227.
New Guinea Tree Dwellings 2452.
A Native's Hut in the Philippines 2766.
Samoan Basket-Work Hut 2623.
A Samoan Schoolhouse 3120.
A Maori Home—New Zealand 2499.
Interior of a Native House of Southern Chile 736.
Native Huts of Panama 2649.
Architecture of the Incas 1741.
American Indian Tepees 1764.
Indian Architecture at Its Best 1774.
Hopi Indians, Southwestern United States 1766, 1769.
Ruins of a Three-Story Cliff-Dwelling in Colorado 793.
Ruins of a Cliff-Dwelling in Arizona 205.
First Homes of the Pilgrims at Plymouth 2842.
Colonial Home of William Penn, Philadelphia, 2761.
Home of Miles Standish 2842.
A Home of Early Chicago 722.
A Hunter's and Fur Trapper's Cabin in Northern Canada 1389.
Winter Quarters in Eskimo Land 1175.
Note: For pictures of great buildings consult the list in the Outline on Architecture.

# Picture Story of Transportation

How Men Have Conquered the Earth 3525.
Some Primitive Types of Water Craft 443.
Ancient Egyptian Chariots 1103.
The Chariot of Ancient Rome 3040.
The Famous Irish Jaunting Car 1809.
Rural Ireland's Typical Donkey Cart 1807.
The Dogs that Bring the Milk in Belgium 374.
A Two-Wheeled Dray in Stockholm 3403.
Spanish Mules and Their Packs 3300.
A Portuguese Peasant's Oxcart 2890.
In Italy Oxcarts Haul the Famous Carrara Marble 1838.
A Bulgarian "Taxicab" 532.
Reindeer Sleds of Snow-Bound Russia 3085.
Russian Train Crossing the Steppes 3086.
A Russian Peasant Cart 3086.
Part of Cairo's Transportation System 567.
Rickshaw with Zulu Runner of South Africa 39.
Hauling Freight in Madagascar 2105.
A Desert Caravan of Asia 233.
Low Carriage, Typical Summer Conveyance in Remote Siberia 3228.
Japanese Palanquins 1867.
A Chinese Taxi—Fare One Cent 638.
Camels, the Railway Cars of Manchuria 590.
The Yak, the Tibetan Train and Steamship 231.
A Siamese Freight Train 3227.
Camel Riders of India 1746.
Palanquins, the Fashion for Ladies in India 1747.
Covered Ox-Cart of India 3524.
The Filipino's "Auto" 2765.
An American Indian's Moving Van 1767.
American Prairie Schooners of the Old Days 584.
"Best Friend," the First American Locomotive 2963.
A "Wood-Burner" Locomotive of the 60's 2963.
Subways Relieve Traffic Congestion of New York City 2498.
Ferries on the Hudson Between New York and New Jersey 2495.
Train Being Ferried Between Detroit and Windsor, Ontario 2970.
A Logging Train on Vancouver Island 606.
One of Cuba's "Toy" Railroads 937.
The Ox Teams of Costa Rica 896.
A Double-Decked Street Car of Chile 736.
Dog Sleds Carrying Mail in the Arctics 2896.
"Huskies" of the Frozen North 1020.
The Shetland Pony of the Arctics 76.
Rivals of the Road—Steam and Electricity 2969.
Hauling Freight with Electric Power 2968.
The Car that Runs on One Rail 1555.
First Self-Propelled Vehicle to Run Along a Road 275.
The Grandfather of American Automobiles 274.
Sailing Vessels 3209.
First Great Liner 3208.
Comparison of Mayflower and Modern Ship 3207.
Launching Ships 3215.
Size of Sea Giants 3216.
The Family Tree of the Modern Balloon 315.
Flying Machine History in Pictures 57.
The First Balloon Ascension 313.
The Start of a Balloon Race at Paris 316.
Observation Balloons in the World War 317.
The First Machine to Fly Across the Atlantic 63.
Some Interesting Mechanical Birds of the United States 62.

# PHYSIOLOGY, HYGIENE, and MEDICINE

A SOUND knowledge about the structure of the human body and the normal function of its various parts is an essential of modern life. Such knowledge not only encourages healthful habits, but also is a safeguard against groundless fears of disease which are often as debilitating as the disease itself. This Outline is intended merely as a brief survey of the chief parts of the body and their work, the simple laws of hygiene, and a few of the outstanding features of medical history and practice. In the Outline on Home Economics will be found a more complete survey of Foods and Food Values than has been made here. In the Outline on Biology the general laws of life are reviewed in a more scientific manner. Some aspects of Psychology which have a bearing on the formation of healthful mental habits will be found in the Outline on Education.

I. PHYSIOLOGY AND ANATOMY: 2792, 121.
   A. Framework of the Body:
      a. Skeleton: 3244, 3634.
      b. Composition of Bone: 452.
      c. Hands 1571; Feet 1322.

B. Muscles—How the Body is Moved: **2372.**
C. Digestion—the Process by which the Food is Changed So that It Can be Absorbed by the Body: **1010.**
  a. The Teeth—Preparing the Food for Digestion: **3452.**
  b. The Stomach and How It Works: **3360.**
  c. The Liver—the Largest Gland Organ in the Body: **2031.**
  d. Other Glands that Aid Digestion: **1469.**
  e. Enzymes—Chemical Substances that Aid Digestion: **1172, 2724.**
D. Circulation:
  a. The Blood and Its Journey Through the Body: **437.**
  b. The Heart—the Center of the Circulatory System: **1615.**
  c. Function of the Lungs in Circulation: **2083.**
  d. The Pulse: **2933.**
E. Respiration: **2998.**
  a. The Lungs: **2083.**
  b. The Diaphragm—the Principal Muscle of Respiration: **1005.**
  c. The Voice and Its Organs: **3656.**
F. Removal of Body Wastes:
  a. Function of the Intestines: **1011.**
  b. The Kidneys—the Filtering Plant for the Blood: **1922.**
  c. The Sweat Glands: **3246.**
G. Special Glands: **1469.**
H. How the Body is Governed:
  a. The Brain—the Executive Offices of the Body: **486.**
  b. The Nerves—the Body's Telephone System: **2436.**
  c. The Special Senses and Their Organs: Eye 1213; Ear 1056; Tongue and Organs of Taste 3513; Sense of Smell 3252; Touch and Temperature 3520.
I. The Skin—the Covering of the Body: **3245.**
  a. Hair: **1559.**
  b. Nails: **3246, 1680.**

II. HYGIENE—THE CARE OF THE BODY: **1713.**
A. Exercise:
  a. Physical Training: **2784.**
  b. Athletics: **251.**
  c. Play for Children: **2832.**
B. Food—What to Eat to Build Healthy Bodies: **1320.**
  a. Protein and the Foods Which Contain Them: **2926.**
  b. Vitamins—Mysterious Food Substances Essential to Proper Growth and Preservation of the Body: **3651.**
C. The Value of Sleep: **3250.**
D. Sanitation and Ventilation:
  a. Personal Cleanliness: **1713, 1452.**
  b. Sanitation in the Home: **1715, 1675.**
  c. Heating and Ventilation: **1621.**
  d. Uses of Antiseptics: **151.**
E. Baby Care: **291.**
F. Public Health:
  a. Health Department: **1612.**
  b. Plumbing and Sewerage: **2840, 3183.**
  c. Waterworks: **3701.**
  d. Pure Food Laws: **2936.** Meat Inspection 2182; How the Dairyman Keeps Milk Pure 952.

Note: Additional information on Hygiene is contained in many of the articles on the different parts and organs of the body listed in Section I, and in the following section on Medicine and Surgery.

III. MEDICINE AND SURGERY: **2192.**
A. Germ Theory of Disease: **1449.**
  a. Bacteria: **302.**
  b. Protozoa: **2927.**
B. Disease Carriers:
  a. Mosquito—the carrier of Malaria and Yellow Fever: **2334, 2651.**
  b. Flea—the Bubonic Plague Carrier: **1292, 433.**
  c. Tsetse Fly—the Insect which Produces the Dreaded Sleeping Sickness: **3546.**
  d. House fly—Carrier of Typhoid Fever, Tuberculosis, and Many Other Diseases: **1312.**
C. Other Disease Parasites: Worms (3813), including the Hookworm (1679), the Filaria, a cause of Elephantiasis; the Trichina, producer of Trichinosis; the Tapeworm; and others.
D. Prevention and Treatment of Disease:
  a. Antitoxins and Serums: **151.**
    1. Vaccination: 3613.
    2. Pasteur's work: 2692.

b. Surgery: **2193.**
   1. Anesthetics: 124.
   2. Use of Antiseptics: 150.
   3. Use of the X-Ray and Radium: 3824, 2958.

c. Drugs: **1041.** Among the common drugs are Ammonia compounds 118; Arsenic 220; Atropin 2509; Camphor 594; Carbolic Acid 641; Eucalyptol 1186; Formaldehyde compounds 1331; Iodine 1802; Calomel and other Mercury Compounds 2200; Opium compounds (Laudanum, Morphine, Heroin) 2584; Pennyroyal and Menthol 2257; Quinine 2950; Silver compounds 3242; Strychnine and Nux Vomica 3372; Witch-Hazel 3774.

   Note: Many of the common drugs improperly used are poisons. For a list of the principal poisons and their antidotes read the articles on Poisons and First Aid (1270, 2854).

d. Osteopathy: **2603.**

e. Dentistry: **997.**

E. Auxiliary Medical Agencies:

a. Hospitals: **1687.**

b. Nursing and First Aid: **2544, 1266**

# Picture Aids in Physiology and Hygiene

Picture Studies of Our Body Machinery 2793-6.
The Marvelous Framework of the Body 3244.
The Great Brotherhood of the Backbone 3245.
The Three Types of Heads 2956.
The Control Station of Your Body 487.
How the Artist's Brain Paints a Picture 489.
Chief Parts of the Brain 490.
The Inside of the Brain 491.
Structure of the Spinal Cord 2437.
How Your Ears Carry Messages to Your Brain 1056.
How Our Ears "Hear" Air Waves 1057.
How We Move Our Eyes 1213.
Mechanism of the "Living Camera" in Our Heads 1214.
How the Eye "Shutter" is Controlled 1214.
Lens Action of the Eye 1988.
Focusing the "Living Camera" 1216.
The "Photographic Plate" of the Eye 1216.
The White-Capped Millers that Grind Our Food 3453.
How We Do Our Tasting 3513.
How the Heart Keeps the Blood Stream Flowing 1616.
Where We Get Air into the Blood 2083.
Muscles that Work the Arm 2372.
Muscles under the Microscope 2373.
How We "Work" Our Legs 2373.
A Heavy Load We Never Notice 50.
The Inside Facts about the Air We Breathe 52.
Measuring Air Moisture 1717.
The Most Wonderful of All Life's Processes 395.
Birth of a New Cell—Multiplying by Dividing 671.
How Single Cells Grow into Thousands 672.
How the Old Life Passes into the New 1643.
How Your Finger-Prints Follow You Through Life 1248.
Here's a Test for Quickness and Accuracy 1792.
Testing the Speed of Eye and Brain 1793.
Exercises to Keep You Strong and Healthy 2785.
Illustrating Some Rules of Hygiene 1714-5.
Why Everybody is Drowsy but Baby 1712.
Picture Aids to Baby Care 292-4.
The Right Kind of a Breakfast 1320.
This is Her Dinner 1321.
And This is Her Supper 1321.
Guardians of Our Health at Work 1613.
How Theaters Get Pure Warm Air 1623.
Cleaning up the City of Colon 2655.
Filtering Water for a Great City 3703.
Picture Guides to First Aid Work 1267-70.
Sir James Y. Simpson Discovering the Power of Chloroform 124.
The Sleep that Saves from Pain 125.
Bacteria of Sour Milk, Alcohol, Vinegar, and Cheese 302.
Germs of Typhoid, Sleeping Sickness, and Plague 1450.
Diphtheria Bacilli, Cholera Germs, and "White Plague" Germs 1452.
The Flea that Carries Plague 1292.
A Deadly Enemy of Mankind 1312-
The Anopheles Mosquito, Carrier of Malaria 2334.
The "Biting" Apparatus of the Female Mosquito 2334.
The Yellow Fever Carrier 2336.
How Mosquitoes Spread Malaria 2337.
Various Kinds of Parasites 2678-80.
A Curious Way to Cure the Toothache 1750.
Propitiating the God of the Waters 1768.
Work of the Medicine Men among the Indians 1773.
Magic Rites to Cure Illness 2118.
The Witch Doctor's "Watch Dog" 2120.
How Our Invisible Defenders Resist Disease 1451.
Making Typhoid Vaccine for the Army 3613.
Poisons that Grow in Field and Forest 2852-5.
How the Mysterious X-Rays are Created 3825.
How a Doctor Sees Your Bones 3826.

# Books on Physiology and Hygiene

## FOR YOUNG READERS

Our Bodies and How We Live. Albert Franklin Blaisdale.
The Child's Day. Woods Hutchinson.
The Body at Work. Francis G. Jewett.
Primer of Sanitation and Physiology. John Woodside Ritchie.
Health, Strength, and Power. Dudley Allen Sargent.
Health in Home and Town. Bertha M. Brown.
Wonders of Science. Eva March Tappan.
How to Get Strong. William Blaikie.
Sound Bodies for Our Boys and Girls. William Blaikie.
Primary Physiology and Hygiene. James W. Mayberry.
First Aid for Boys. Norman B. Cole and Clayton H. Ernst.

## FOR OLDER READERS

Physiology and Health. Herbert W. Conn.
Studies in General Physiology. Jacques Loeb.
Practical Physiology. A. P. Beddard.
The Elements of Physiology and Sanitation. Louis John Rettger.
Healthful Living. Jesse F. Williams.
Health and Social Progress. Rudolph M. Binder.
Physiological Chemistry. Albert P. Mathews.
How to Keep Well. William A. Evans.
The Efficient Life. L. H. Gulick.
How to Live: Rules for Healthful Living. Irving Fisher and Eugene Lyman Fiske.
A Textbook of Gymnastics. K. A. Knudsen.
How to Breathe Right. Edward Lankow.
A Rational System of Home Exercise. P. G. Masters.
The Newer Knowledge of Nutrition. Elmer V. McCollum.
Vitamines, Essential Food Factors. Benjamin Harrow.
Food Values, What They are and How to Calculate Them. Margaret McKillop.
American Red Cross Textbook on Home Dietetics. Ada Z. Fish.
Social Service and the Art of Healing. R. C. Cabot.
Medical Science of Today. W. H. Evans.
A Text-Book of Gymnastics. K. A. Knudsen.
Nerves and the Man. W. Charles Loosmore.
The History of Medicine. D. A. Gorton.
History of Osteopathy and Twentieth Century Medical Practice. E. R. Booth.
Short History of Nursing. Lavinia L. Dock.
A Text-Book of Simple Nursing Procedure. Amy E. Pope.



# LANGUAGE *and* LITERATURE

LANGUAGE is the tool of thought. To think clearly and to grasp firmly the expressed thoughts of others requires a sure knowledge of words and of the manner in which words are put together into phrases and sentences. But language is not an artificial product of science, governed by rigid rules and conventions which can be memorized. It is a gradual growth, rooted in custom and tradition, improved by centuries of development, and enriched by the skilful use of generations of great minds. The study of grammar alone will not, therefore, give us the mastery of language essential to clear thought and understanding. We must get a certain intuitive "feel" for our own tongue which can be obtained only by steeping ourselves in the great literature of the past and the present. If we can also familiarize ourselves with the famous masterpieces of other languages, we shall redouble our capacity for expression and enjoyment.

I. THE THEORY OF LANGUAGE:
- A. **Philology, the Science of the Growth and Relationship of Languages: 2770.**
  - a. **Etymology, the History of Words: 2771.**
    1. Etymology of English Words: 1161.
    2. How Personal Names Originated: 2388.
    3. How Slang Words Have Crept into Languages: 3248.
  - b. **Language Types: 2771.** Inflected, Agglutinative, and Isolating Languages.
- B. **Grammar, the Science of the Correct Use of Language: 1492.**
  - a. **Sentence: 3174, 1493.** Phrases and clauses; sentences classified according to structure.
  - b. **Parts of Speech: 1494.** Nouns 2537; Verbs 3627; Pronouns 2921; Adjectives 25; Adverbs 26; Conjunctions 862; Prepositions 2912; Interjections 1493.
  - c. **Punctuation: 2934.**
- C. **Rhetoric, the Art of Effective and Pleasing Use of Language: 3004; Figures of Speech: 1238.**

II. THE LANGUAGES OF VARIOUS PEOPLES:
- A. **African Languages: 37.**
- B. **Asiatic Languages:**
  - a. **Chinese: 744.**
  - b. **Indian: 1748.**
  - c. **Hebrew: 1624.**
- C. **European Languages: 1192.**
  - a. **Teutonic Tongues: 3472; 2771.** English 1161; German 1435; Scandinavian 3134.
  - b. **Celtic Languages: 674, 1814.** Erse, Manx, Gaelic, Welsh, and Breton.
  - c. **Romance Languages: 3040.** French 1363; Italian 1832; Spanish 3307; Portuguese 2889.
  - d. **Slavonic Languages: 3250.** Russian, Polish, Serbian, etc.
  - e. **Non-Aryan Tongues of Europe:** Magyar 1702; Finnish 1248; Esthonian 1180.
- D. **Languages of Indigenous American Peoples:**
  - a. **Indian Languages and Dialects: 1768.**
  - b. **Eskimo Language (also in Asia): 1174.**
- E. **Artificial Universal Languages (Esperanto, Volapuk): 1177.**
- F. **Ancient Languages: Greek 1534; Latin 1965; Sanskrit 2771.**

III. WRITTEN LANGUAGE:
- A. **Writing: 3816.**
  - a. **Picture-Writing and Hieroglyphic Writing: 1649, 100.**
  - b. **Cuneiform Writing: 939, 294.**
  - c. **Alphabetic Writing: 100, 2774.**
  - d. **Methods and Materials:** Handwriting 1574; Shorthand 3224; Typewriter 3573; Pen 2709; Paper 2666; Ink 1779; Pencil 2712.
- B. **Printing: 2916.**
  - a. **Type and Typemaking: 3572.**
    1. Linotype: 2019.
    2. Monotype: 2303.
    3. Electrotyping and Stereotyping: 1125, 3355.
  - b. **Products of the Press:** Books 455; Newspapers 2472; Magazines 2475.

*consult the Easy Reference Fact-Index at the end of this work*

IV. FORMS OF LITERATURE:
- A. Poetry and Its Forms: **2850.**
  - a. **Lyric: 2851.** For examples read Burns' 'Lines to a Daisy' 542; Joyce Kilmer's 'Trees' 173; A. E. Houseman's 'Shropshire Lad' 2850.
  - b. **Dramatic: 2851, 1031.** Shakespeare's plays furnish an excellent example of dramatic poetry.
  - c. **Epic: 2851.** Milton's 'Paradise Lost' (2244), and Spenser's 'Faerie Queene' are well known epics.
- B. **Prose Forms:** Romance 3039; Novel 2539; Short Story 2541; Oration 3004, 1537; Essay 1177.
- C. **Drama: 1032.**

V. NATIONAL LITERATURES:
- A. **Hebrew Literature: 1624.** Read the articles on the Old Testament (388) and on the Book of Job (1894) which is considered to be among the greatest poems dealing with man's spiritual history.
- B. **Other Asiatic Literatures:**
  - a. **Arabian:** See 'Arabian Nights' (168) and 'Story of Aladdin's Lamp' (169).
  - b. **Chinese: 744.**
  - c. **Hindu: 1755.**
  - d. **Persian: 2738.**
- C. **Greek and Latin Literature: 1534, 1965.**
  - a. **Great Greek Authors and Their Works:** Homer 1675 (stories from the 'Iliad' 3542, 8, 9, 248, 1626; stories from the 'Odyssey' 2562, 944); Aesop and his Fables 30; Herodotus 1645; Socrates 3270; Plato 2832; Aristotle 195; Xenophon 3823; Demosthenes 993; Plutarch 2840.
  - b. **Some Great Roman Authors:** Cicero 765; Caesar 563; Vergil 3630 (The Story of the Wooden Horse from the 'Aeneid' 3542).
  - c. **Drama and Dramatists: 1032, 1038.** Aeschylus, Sophocles, Euripides, Aristophanes, and Menander, famous Greek dramatic writers; Plautus, Terence, and Seneca, great dramatists of the Romans.
  - d. **Mythology:** See the Study Outline on Mythology.
- D. **English Literature:** 1163, 3039.
  - a. **Early Literature:** 'Beowulf', the great Anglo-Saxon Epic; Arthurian Legends 223, 3068, 1391; Legends of Robin Hood 3028.
  - b. **Chief Poets and Their Works:** Caedmon 563; Geoffrey Chaucer 701 (Tales Told by the Canterbury Pilgrims 704); Sir Thomas More 2325; Sir Walter Raleigh 2974; William Shakespeare 3188 ('As You Like It' 224, 'Hamlet' 1569, 'King Lear' 1926, 'Macbeth' 2094, 'Merchant of Venice' 2199, 'Midsummer Night's Dream' 2230, 'Othello' 2603, 'Romeo and Juliet' 3058, 'The Tempest' 3465, 'Winter's Tale' 3756); John Milton 2240 (The story of 'Paradise Lost' 2244); John Dryden 1043; Alexander Pope 2879; Oliver Goldsmith 1483; William Cowper 910; Robert Burns 541; Sir Walter Scott 3150; Samuel Taylor Coleridge 825; William Wordsworth 3788; Lord Byron 551; Percy Bysshe Shelley 3204; John Keats 1914; Elizabeth Barrett Browning 516; Robert Browning 517; Alfred Tennyson 3470; Rudyard Kipling 1926.
  - c. **Chief Prose Writers and Their Works:** Sir Thomas Malory's 'Morte d'Arthur' 223; Lord Francis Bacon 300; John Bunyan 534 (story of 'Pilgrim's Progress' 535); Daniel Defoe 986 (story of 'Robinson Crusoe' 933); Jonathan Swift 3406 (story of 'Gulliver's Visit to Lilliput' 3407); Samuel Johnson 1898; Oliver Goldsmith 1483; Edmund Burke 540; Charles Lamb 1957; Sir Walter Scott 3150 ('The Tournament of Ashby' from 'Ivanhoe' 3152); Thomas Macaulay 2093; Thomas Carlyle 644; Benjamin Disraeli 1013; John Ruskin 3083; William Makepeace Thackeray 3479 (story of 'The Newcomes' 3480); Charles Dickens 1006 (story of 'Pickwick Papers' 1007, story of 'A Christmas Carol' 760); "George Eliot" 1134 (story of 'Silas Marner' 1135); "Lewis Carroll" 647 (story of 'Alice in Wonderland' 647); Thomas Hardy 1582; Robert Louis Stevenson 3355; Rudyard Kipling 1926 ('The Story of Mowgli' from 'The Jungle Book' 1927); Sir James Matthew Barrie 333 (story of 'Peter Pan').
  - d. **Drama and Chief Dramatists:** 1164, 1034, 2259. For a list of England's chief dramatists and their works see page 1038.
- E. **Irish Literature: 1814.**
  **—Drama and Dramatists: 1036, 1038.**
- F. **American Literature: 111.**
  - a. **Chief Poets:** William Cullen Bryant 521; Edgar Allen Poe 2848; Ralph Waldo Emerson 1141; Henry David Thoreau 3492; Henry Wadsworth Longfellow 2057 (story of 'The Song of Hiawatha' 2059); Oliver Wendell Holmes 1674; John Greenleaf Whittier 3736; James Russell Lowell 2073; Walt Whitman 3734; Eugene Field 1236; James Whitcomb Riley 3020.
  - b. **Chief Prose Writers:** Benjamin Franklin 1357; Washington Irving 1830; James Fenimore Cooper 878; Edgar Allen Poe 2848; Nathaniel Hawthorne 1607; Oliver Wendell Holmes 1674; Harriet Beecher Stowe 3368; Henry David Thoreau 3492; Edward Everett Hale 1561 (story of 'The Man Without a Country' 1562); Francis Parkman 2686; Bret Harte 1594; Louisa May Alcott 84; "Mark Twain" 3569; William Dean Howells 1689; Sydney Lanier 1961; William Sydney Porter ("O. Henry") 2884; John Burroughs 543; John Muir 2365.
  - c. **Drama and Dramatists: 1036, 1038.**
- G. **Canadian Literature: 623.** William Henry Drummond and his works 1042; Sir Gilbert Parker and his works 2685; a folklore tale of the Canadian Indians from Cyrus Macmillan's 'Fairy Tales from Canada' 611.

H. French Literature: **1363.**
   a. Early Romance: **3039.** Story of Roland 3038.
   b. Chief Poets and Prose Writers: Jean Froissart 1375; François Rabelais 2951; Michel de Montaigne 2308; Pierre Corneille 891; Madame de Sévigné 3181; Jean Baptiste Racine 2957; Molière 2279; Voltaire 3660; Jean-Jacques Rousseau 3070; Honoré de Balzac 323; Victor Hugo 1694 (story of Jean Valjean from 'Les Miserables'); Alexandre Dumas 1047; Jean-Henri Fabre 1217; Emile Zola 3840.
   c. Drama and Chief Dramatists: **1034, 1036.** For a list of the chief dramatists of France and their works see page 1038.
   d. French Academy: **4.**

I. German Literature: **1435.**
   a. Early Literature: **1436.** Song of the Nibelungs 2504.
   b. Some Important Figures in German Literature and Their Works: Martin Luther 2084; Johann Wolfgang Goethe 1477; Johann Christoph Friedrich Schiller 3137; Heinrich Heine 1628; Richard Wagner 3663.
   c. Chief Dramatists: **1038.**

J. Russian Literature: **3096.**
   a. Chief Authors and Their Works: **3098.** Ivan Turgenief 3554; Leo Tolstoy 3512.
   b. Chief Dramatists and Their Works: **1038.**

K. Italian Literature: **1832, 2995.**
   a. Chief Authors and Their Works: **1833.** Dante Alighieri 957 (story of Dante's 'Divine Comedy' 958); Torquato Tasso 3439; Francesco Petrarch 2995; Giovanni Boccaccio 2996.
   b. Chief Dramatists: **1038.**

L. Spanish Literature: **3307.** Miguel de Cervantes Saavedra 682 (story of 'Don Quixote' (683); Vicente Blasco Ibanez 1719.
   b. Chief Dramatists and Their Works: **1038.**

M. Scandinavian Literatures: **3134, 1724.**
   a. Early Literature: see the Outline on Mythology under the heading Norse and Teutonic Mythology.
   b. Some Scandinavian Writers: Selma Lägerlof 1957; Björnstjerne Björnson 432; Henrik Ibsen 1721; Hans Christian Andersen 121.

N. Other European Literatures:
   a. Portuguese: **2889.**
   b. Belgian: Maurice Maeterlinck 2111; story of 'The Blue Bird' 2113.
   c. Dutch: Erasmus of Rotterdam 2996.

VI. READING: **2979.**
   A. Literature for Children: **2027.**
   B. Libraries and How to Use Them: **1991.**

# Books for the Literature Student

**Development of English Literature and Language.** Alfred H. Welsh.
**The English Language.** Logan Pearsall Smith.
**The History of the English Language.** O. F. Emerson.
**The Making of English.** Henry Bradley.
**History of the English Language.** Thomas R. Lounsbury.
**The Standard of Usage in English.** Thomas R. Lounsbury.
**Words and Their Ways in English Speech.** J. B. Greenough and G. L. Kittredge.
**The Study of Words.** R. C. Trench.
**A Primer of English Etymology.** W. W. Skeat.
**The Romance of Words.** Ernest Weekley.
**Eighteen Thousand Words Often Mispronounced.** W. H. P. Phyfe.
**English Composition and Style.** W. T. Brewster.
**The Author's Craft.** Arnold Bennett.
**Introduction to the Methods and Materials of Literary Criticism.** C. M. Gayley and F. N. Scott.
**Gateways to Literature.** Brander Matthews.
**Literary Taste, How to Form It.** Arnold Bennett.
**The Choice of Books.** Frederic Harrison.
**Appreciation of Literature.** George Edward Woodberry.
**Talks on the Study of Literature.** Arlo Bates.
**Essays in Criticism.** Matthew Arnold.
**Literary Essays.** James Russell Lowell.
**Lectures on the English Poets.** William Hazlitt.
**Studies in Literature.** Edward Dowden.
**Familiar Studies in Men and Books.** Robert Louis Stevenson.
**Sesame and Lilies.** John Ruskin.
**Initiation into Literature.** Émile Faguet.
**Voices of Tomorrow.** E. Björkman.
**History of English Literature.** H. A. Taine.
**English Literature.** Stopford Brooke.
**Illustrated History of English Literature.** Richard Garnett and Edmund L. Gosse.
**English Literature.** William J. Long.
**American Literature.** William J. Long.
**The Spirit of American Literature.** John Macy.
**History of Classical Greek Literature.** J. P. Mahaffy.
**History of Ancient Greek Literature.** G. G. Murray.
**Latin Literature.** J. W. Mackaie.
**Short History of French Literature.** George Saintsbury.
**History of German Literature.** W. Scherer.
**History of Italian Literature.** Richard Garnett.
**History of Spanish Literature.** George Ticknor.
**An Outline of Russian Literature.** M. Baring.
**World Literature and Its Place in General Culture.** Richard Green Moulton.
**The Nature and Elements of Poetry.** Edmund Clarence Stedman.
**Handbook of Poetics.** Francis B. Gummere.
**The English Novel.** Sir Walter Raleigh.
**Development of the English Novel.** Wilbur L. Cross.
**The Advance of the English Novel.** William Lyon Phelps.
**A Study of Prose Fiction.** Bliss Perry.
**Philosophy of the Short Story.** Brander Matthews.
**English Drama.** F. E. Schelling.
**A Book About the Theatre.** Brander Matthews.
**Modern Dramatists.** Ashley Dukes.
**The British and American Drama of Today.** Barrett H. Clark.
**Main Currents of the Nineteenth Century.** Georg Brandes.

# FINE ARTS



ART is as old as the human race. Long before men learned to write, they were striving to express in concrete form their faith and their fears, their ideals and their hopes. Crude monuments to the dead, figures carved in bone, horn, and ivory, drawings upon cave walls are among the most valuable records we possess of the civilization which existed before the dawn of history. Ancient traditions and legends were embodied in songs which were passed on from generation to generation before alphabets were invented. And, as civilization grew, men placed more and more emphasis upon the expression of their emotions and their sense of beauty through the arts. Artists were honored above all other workers, and took their station by the side of kings and nobles. Today we build veritable palaces in which to house great paintings and statues; we exalt those who can play or sing with special skill the masterpieces of music; we travel half-way around the world to view the outlines of some famous building. But aside from the pleasure it gives us, a study of Art has an educational importance often overlooked. The history of Art is also the history of the manners and customs of people in all periods and countries. It contains a vivid narrative of the development of ideas and ideals, and gives us a key to the story of mankind often more valuable than any written record. The Fine Arts may be grouped in various ways according to different points of view. Primarily, however, they are usually grouped into Major and Minor Fine Arts.

I. **THE MAJOR FINE ARTS:** Architecture, Sculpture, Painting, Music, and Poetry. In the following Study Outlines is gathered together the material on the first four of these subjects. The material on Poetry will be found in the preceding Outline on Language and Literature.

II. **THE MINOR FINE ARTS:** Among the many Minor Fine Arts may be mentioned Drama 1031, 3482; Dancing; Engraving and Etching 1168; Mosaic Working 2330; Tapestry Weaving 3433; Embroidery 1140; Stained Glass Making 1474; Ceramics 2903, 1874; The Glyptic Arts of Modeling and Carving Medals, Intaglios, Cameos, Jewelry, etc. 591; Joinery 1383. Most of the Minor Fine Arts, it will be seen, are closely allied with a Major Art, as Mosaic Working with Painting and the Glyptic Arts with Sculpture.

## Architecture

I. **EGYPTIAN ARCHITECTURE: 176, 1099.**
   - A. **Characteristics:** Vast tombs of kings and solemn temples of the gods, built by an enslaved population; massive stone edifices of the "column and lintel" type, with walls often sloping instead of perpendicular on the outside; use of column foreshadowing Greek architecture; profuse ornamentation, both carved and painted.
   - B. **Some Notable Examples:** Pyramids 2939, 178 (picture); Temple of Karnak 176 and 178 (pictures); columns 1105 (picture); pylon 1104 (picture), Avenue of Sphinxes 1101 and 1103 (pictures); Obelisks 1105; Temple of Isis at Philae 1107, 1106 (picture).

II. **BABYLONIAN AND ASSYRIAN ARCHITECTURE: 176.**
   - A. **Characteristics:** Gorgeous temples and palaces set on broad terraces, approached by imposing stairways

and built of baked or sun-dried brick and enameled tile; stone used in later period; arch and turret forms often employed.

B. **Typical Examples:** Hanging Gardens of Babylon 3177, 3179 (picture); palace of an Assyrian King 295 (picture).

III. **GREEK ARCHITECTURE: 176.**

A. **Characteristics:** Noble temples, theaters, gymnasia, etc.; "column and lintel" type of edifice, built of marble or of coarser stone covered with stucco, sometimes without a roof, sometimes roofed with tiles or slabs supported on wooden beams; three styles or "orders"—Doric, Ionic, and Corinthian 177, 180, (picture).

B. **Some Notable Examples:**

a. **Doric:** Parthenon 11, 176 (picture); temple of Theseus 250 (picture).

b. **Ionic:** Temple of the Wingless Victory 250 (picture); Mausoleum at Halicarnassus 1531 (picture); Erechtheum 11, 250 (picture).

c. **Corinthian:** Monument of Lysicrates 250 (picture).

IV. **ROMAN ARCHITECTURE: 177.**

A. **Characteristics:** Stately, ostentatious temples, monuments, basilicas, forums, amphitheaters, and circuses, and highly practical aqueducts and baths; richly ornamented buildings built of brick, stone, and cement and concrete and faced with brick, marble, or mosaic; structural forms included. The arch (174), the vault, the dome, and columns of the three Greek orders.

B. **Some Notable Examples:** Pantheon 181 (picture); Colosseum 3050, 181 (picture); Forum 3050, 3053 (picture); Baths of Caracalla 3052, 3057 (picture); Castle of Sant' Angelo or Mausoleum of Hadrian 3051 (picture); Arch of Titus 3051 (picture); aqueduct at Segovia 163 (picture); residence at Pompeii 2877.

V. **BYZANTINE ARCHITECTURE: 178.**

A. **Characteristics:** Huge squatty churches, with interiors of soaring splendor and dazzling magnificence; domes placed over rectangular compartments by means of pendentives; buildings constructed of brick and stone faced with precious marbles and gorgeous mosaics 552, 2630 (picture).

B. **Some Notable Examples:** Santa Sophia at Constantinople 182 and 183 (pictures); St. Mark's Cathedral at Venice 3623, 1197 (picture); Church of the Three Saints at Jassy 3082 (picture).

VI. **MOHAMMEDAN ARCHITECTURE:** Called "Moorish" or "Saracenic" in the West.

A. **Characteristics:** Graceful gay-hued mosques and tombs with bulbous domes, round, lancet, and horseshoe arches, slender minarets, and fretted screens in geometric patterns or arabesques; built of all structural materials including marble, and decorated with exquisite mosaics and inlays of silver, gold, enamels, and semi-precious stones.

B. **Typical Examples:** Taj Mahal 3429, 3431 (picture); Tomb at Agra 1754 (picture); palaces in India 1755 (picture); tower at Delhi 989 (picture); Mosque of Shah Jehan 990 (picture); Azhar Mosque at Cairo 569 (picture); Mosque at Constantinople 2276 (picture); one of Teheran's Porcelain Gates 2736 (picture); Alhambra 3298 (picture).

VII. **ROMANESQUE ARCHITECTURE: 180.** Called "Lombard" and "Tuscan" in Italy, "Romane" in France, "Rhenish" in Germany, and "Saxon" and "Norman" in England and Scotland.

A. **Characteristics:** Dignified churches and palaces and massive castles; round arches framing doors and windows and springing from round columns or piers to form the cloisters or arcaded courts of churches; thick stone walls pierced with small windows; roofs at first flat and timbered, later vaulted in stone by means of the plain barrel or groined vault; decoration sometimes rude and spare, sometimes rich and exuberant.

B. **Some Notable Examples:** Cathedral of Pisa 2811 and 184 (pictures); Leaning Tower of Pisa 2810, 2811 (picture); Tower of London 2049, 2056 (picture); Carnavon Castle, Wales 3665 (picture).

VIII. **GOTHIC ARCHITECTURE: 181, 662.** Divided into periods in different countries, "Lancet," "Rayonnant," and "Flamboyant" in France; and "Early English," "Decorated," and "Perpendicular" in England. "Tudor" is late Perpendicular already verging toward the Renaissance style.

A. **Characteristics:** Wonderfully varied forms especially in cathedrals; emphasizing the vertical line, and reaching to new heights, with great lofty window spaces filmed with stained glass; use of pointed arch 187 (picture); timbered roofs used in residences and smaller churches and vaulted stone roof supported on stone ribs in larger edifices; stone walls thinner than in Romanesque buildings and reënforced by close and flying buttresses 186 and 1199 (pictures); decoration sometimes severe and sparse, sometimes rich and fantastic.

B. **Some Notable Examples:** Cathedral of Notre Dame 185 and 186 (pictures); Cathedral of Amiens 117 (picture); Giotto's Tower, Florence 1461, 1462 (picture); Cathedral of Florence 1834 (picture); Cathedral of Milan 1843 and 1199 (pictures); Cologne Cathedral 834 (picture); Cloth Hall at Ypres 3834 (picture); Westminster Abbey 2049 and 3719 (pictures); Canterbury Cathedral 637 (picture).

IX. **RENAISSANCE ARCHITECTURE: 188, 2997.**

A. **Characteristics:** Sumptuous palaces, chateaux, and churches, expressing not the spirit of whole peoples but the moods and whims of luxurious intellectual aristocracies; formal and classical by intention, and in detail consisting largely of borrowings from Roman antiquity; degenerating finally into the frenzy of the Baroque and Rococo; no new structural features.

B. **Some Notable Examples:** St. Peter's Church 3052, 187 (picture); Palazzo Vecchio at Florence 1849 (picture); St. Paul's Cathedral at London 2052, 2048 (picture); Louvre 1203 (picture); Chateau of Chenonceaux 1342 (picture).

X. MODERN ARCHITECTURE: **189.**
- A. **Characteristics:** After the Renaissance the broad national movements in Architecture virtually ceased and the new designs were the products of individual architects who originated a wide variety of schools more or less independent of one another. All the styles of the past were largely drawn upon, their adaptation to modern use sometimes resulting in well-established new styles such as Mission and Colonial. It was only with the advent of steel and concrete that great new structural principles were evolved. Read the article on Building Construction (528).
- B. **Examples of Modern Styles:**
  - a. **Mission:** A Franciscan mission in California 2301 (picture); Leland Stanford Junior University 581 (picture).
  - b. **Colonial:** Washington's home at Mount Vernon 2358 (picture); White House 3734 (picture); house of William Penn 2761 (picture).
  - c. **"American Renaissance" or Classic Revival:** United States Capitol at Washington 3681 (picture); Pennsylvania Station in New York City 2496 (picture).
  - d. **Modern Gothic:** Houses of Parliament at London 2049 and 2687 (pictures).
  - e. **Sky-scrapers:** A Chicago sky-scraper 188 (picture); the Woolworth Building 2489 (picture); a sky-scraper in process of construction 529 (picture).

XI. ANCIENT NON-CLASSICAL ARCHITECTURE: This includes isolated types of architecture which have played no part in the great chain of development dealt with above.
- A. **Chinese Architecture:**
  - a. **Characteristics:** Gay, bright, comparatively fragile pagodas and memorial gateways built of wood, brick, glazed tile, and, less often, of stone; dominant feature is the tent-like curved roof.
  - b. **Examples:** Temple of Heaven 2708 (picture); arched gateway 747 (picture); tower and gate 2707 (picture).
- B. **Hindu Architecture (Including Javanese) before the Mohammedan Conquest: 1755.**
  - a. **Characteristics:** Strange tombs, shrines, and temples, often scooped from the living rock of caves and hills, or built of stone with high pyramidal towers, fantastically ornamented.
  - b. **Examples:** Pagoda 1753 (picture); Buddhist temple 1878 (picture).
- C. **American Indian Architecture:**
  - a. **Inca Architecture: 1741.** Structures composed of stones, often huge bowlders, put together without mortar, but cut and fitted with extreme accuracy.
  - b. **Aztec Architecture: 289 (picture).** Houses of sun-dried brick and great pueblos, usually of stone, temples and palaces of brick or stone elaborately decorated with carvings and gilding.
  - c. **North American Indian Architecture:** Log dwellings of most advanced hunting tribes 1774 (picture); stone dwellings of the Cliff Dwellers 794, 793 (picture); sun-dried brick dwellings of the Pueblo Indians 1767, 1766 (picture); homes of the Walpi Indians 2463 (picture).

# Sculpture

I. SCULPTURAL METHODS: **3154.**
- A. **Incised Design: 668 (picture).** This method of drawing with a sharp point, practised by cavemen in prehistoric times, though not what we would today call sculpture, may very well have been its direct ancestor.
- B. **Sculpture in Relief: 3154.**
  - a. **Bas-Relief or Low Relief: 296 and 3157 (pictures).** In these sculptures the artists have cut back their background to the depth of the shallow figures and have used modeling freely.
  - b. **High Relief: 3156 (picture).** Here the composition as a whole is part of the slab, but limbs and heads of individual figures here and there are almost free.
  - c. **Sunk Relief or Cavo-Rilievo: 1104 (picture).** In this method the artist cuts into a flat surface so as to leave the figures standing in relief on a sunken ground.
- C. **Intaglio: 3154.** In this method—the opposite of relief—the design is hollowed out below the surface. It is used mainly in the carving of precious stones and in making seals, etc.
- D. **Sculpture "in the Round": 3154.** This is the most "complete" form of Sculpture, the figures being in part, at least, completely "free," so they may be viewed from all sides.

II. PRIMITIVE SCULPTURE: **3155.** The beginnings of sculpture arise wherever men have the impulse to adorn articles of use with decorative shapes, like those of the carved pipes and bowls (1766, 1767) made by Indian craftsmen, or to give outward form to their imaginings concerning the gods or spirits they worship, as did the Alaskan tribesmen who carved totem-poles (74), or to erect memorials bearing the features of the dead, as possibly did the mysterious unknown race that carved the "stone men" of Easter Island (2619).

III. EARLY DEVELOPMENT:
- A. **Egyptian Sculpture:**
  - a. **Characteristics and Materials: 3155.**
  - b. **Typical Examples:** The Sphinx 3316, 1103, 3155; the head of Ptolemy Auletes, which shows that portraiture was comparatively highly developed, 1206; statues of an Egyptian official and his wife, 1206; of Amenhotep III, 1105; of Rameses II, 1106; figures on the pylon, 1104.
- B. **Babylonian and Assyrian Sculpture:**
  - a. **Characteristics: 3155.**

b. **Typical Examples:** Assyrian animal sculpture, 296; winged bulls, which are as typical of Assyrian sculpture as the Sphinx is of Egyptian, 3155, 1206; winged god, 1206.

C. **Aegean Sculpture: 3156, 29, 28** (picture).

IV. GREEK AND ROMAN SCULPTURE:

A. **Archaic Greek: 3156, 1529, 1530** (picture).

B. **The Great Age of Greek Sculpture: 1529.**

a. **The Work of Myron and Polyclitus, and of Phidias, Greatest of Greek Sculptors: 1530, 2759.**

b. **The Work of Praxiteles, Scopas, and Lysippus: 1530.**

c. **Typical Examples:**

1. First Period: 'Discus Thrower' of Myron 1204; Polyclitus' statue of Hera 1639 (description); Phidias' statues of Zeus 3179, 3178 (description); of Athena 12 (description); fragments of the Parthenon frieze 1532, 248; the 'Three Fates' from the Parthenon pediment 1525; Venus de Milo 1203, 155.
2. Second Period: The 'Hermes' of Praxiteles 3156; the Villa Ludovisi 'Mars' believed to be a copy of an original by Scopas or Lysippus 1530; the 'Artemis of Gabii' 1203.

C. **Later Greek and Roman Sculpture: 1532.** Despite a gradual loss of directness and simplicity and an increasing tendency toward realism, affectation, and florid ostentation, many beautiful works were produced in the centuries following the 4th century B.C., and the Romans created fine portrait statues before art was extinguished in the West about the 4th century A.D.

a. **Late Greek Sculpture: 1532.**

b. **Roman Sculpture and How It was Influenced by that of the Greeks: 1533.**

c. **Examples:** The Apollo Belvedere 3159, 156; the Diana with the Stag 1205; the Flora 1204; the Wrestlers 1205; the Young Augustus 1532; Hadrian, Cicero, Hannibal, Trajan, Julius Caesar, Augustus, and Scipio Africanus 3043; reliefs of Trajan's Column 1533; Roman sarcophagus 3156.

V. MEDIEVAL AND RENAISSANCE SCULPTURE:

A. **Medieval: 3156.**

a. **Early Gothic:** Sculpture in the early Christian centuries, hampered not only by lack of skilled artists but by literal interpretation of the commandment against making "any graven image," was confined chiefly to sarcophagi, crucifixes, and objects for the adornment and use of the church. With the rise of Romanesque and Gothic cathedrals and churches, sculpture was more and more freely used as an adjunct to architecture. The early Gothic artists worked "for the glory of God" and not for fame, and their names are lost to us.

b. **Late Gothic in Italy:** Many of the Italian sculptors of the late Gothic period were painters and architects as well. Such were Niccolo Pisano whose pulpits (1201 and 1205), show a study of the antique and thus foreshadow the Renaissance; Giovanni Pisano, son of Niccolo; Andrea Pisano, pupil of Giovanni; Arnolfo di Cambia; and Giotto (1461) who stood at the dawn of the Renaissance.

B. **Renaissance: 3156, 2996.**

a. **Italian Renaissance:** Among the great sculptors of the early Renaissance were Ghiberti 1456; Donatello 3158; the Della Robbias 3158; Verrocchio 1853; Leonardo da Vinci 3644; Michelangelo 2220; Benvenuto Cellini 3158; Giovanni da Bologna 3158. Typical Examples: Ghiberti's bronze doors 1457; 'St. Cecilia' by an unknown sculptor 3157; 'Singing Galleries' of Lucca della Robbia 3160; statue of Captain Colleoni by Verrocchio 1204; Michelangelo's 'Giuliano de' Medici' 3159, 'Lorenzo de' Medici' 2191, 'The Descent from the Cross' 2220, and 'Moses' 2222; Bologna's 'Flying Mercury' 3159.

b. **French Renaissance:** The Renaissance dawned late in France. Jean Goujon and Germain Pilon were its most important sculptors, and their work, though graceful and often vigorous, is not free from the florid affectation of a declining age.

VI. "BAROQUE," LATE CLASSICAL REVIVAL, AND MODERN SCULPTURE: 3158.

A. **"Baroque":** In Post-Renaissance sculpture (17th century), statuesque dignity gave way to violent fluttering movement and florid excesses. The chief sculptor and architect of this period was the Italian J. L. Bernini, a man of great talent and prodigious versatility, acclaimed in his day as a miraculous genius, who filled Rome with "an almost incredible quantity of sculpture of the most varying degrees of merit and hideousness." From Italy this movement spread all over Europe.

B. **Classicist Revival: 3158.** A period of cold formal classicism followed the extravagances of the "Baroque" style. The leading figures in this movement were Canova, an Italian sculptor, and Thorwaldsen, a Dane. See Canova's figure of 'Perseus' 3159.

C. **Modern Sculpture: 3158.**

a. **French Sculptors and Their Work: 3158.**

1. François Auguste Rodin, the greatest sculptor since Michelangelo: 3036.
2. Typical Examples of modern French sculpture: Houdon's 'Washington' 3161; Barye's 'Theseus Slaying the Centaur' 3160; Rude's 'Neapolitan Fisherboy' 3162; Chapu's 'Joan of Arc' 3162; Rodin's best known works 3037; Rodin's 'J. P. Laurens' 3162.

b. **Constantin Meunier of Belgium and His Work: 3158, 3161.**

c. **Modern Sculpture in England:**

1. Thornycroft's 'Teucer': 3161.
2. The extreme modern movement. 3164.

d. **American Sculpture: 3164.**
   1. Saint-Gaudens and his work: 3107.
   2. Some Typical Examples: Saint-Gaudens' 'Lincoln' 3161; Taft's 'Fountain of Time' 723, 'The Blind' 3163; Gutzon Borglum's 'North America' and Konti's 'South America' 109; Powers' 'Buffalo Group' 3163; Nellie Verne Walker's 'Her Son' (frontispiece, Volume 7).

VII. ORIENTAL SCULPTURE:
- A. **Indian Sculpture: 1755, 1749.** A style tending toward the monstrous and exuberant.
- B. **Chinese and Japanese Sculpture: 1874, 744.**
  - a. **Japanese Sculpture:** The Japanese, refined and delicate artists though they are, seem to care little for the beauty of human figure. Yet the "Nara school" of sculpture (6th to 12th century A.D.) takes rank with the Florentine school of European sculpture. Examples 1749, 1873.
  - b. **Chinese Sculpture:** The Chinese have practiced sculpture in stone from early times without gaining any distinction in this direction. With the rise of Buddhism a school of sculptors sprang up, but their art showed no originality and was dominated by Indian models 638 (picture). The real beauty of Chinese sculpture lies in the exquisite bronzes and ivory carvings of the Golden Age, which have cast their influence over the art of many lands.

# Painting

I. PRIMITIVE PAINTING: **2627.**
- A. **Stone Age: 666, 668.** Spirited animal paintings done in three colors on the walls of caves, and pictures scratched on bits of ivory and stone give evidence of the adroitness of hand and keenness of observation of the men of the Old Stone Age. Examples: 668, 2628.
- B. **American Indian:** Far inferior to the work of the Stone Age are the grotesque childish drawings of the Aztecs and of the North American Indians. Examples: 290, 1769.

II. EARLY DEVELOPMENT OF PAINTING:
- A. **Egyptian: 2627, 1100.** Paintings intended not only to decorate walls, but to furnish historical records; conventionalized and symbolic figures often done in brilliant colors which were decorative but not realistic. Examples: 1102, 2629.
- B. **Babylonian and Assyrian: 2628.** Human figures less conventionalized, but also less spirited, and animals more truly portrayed than those of the Egyptians.
- C. **Aegean Painting: 2628, 29.** Aegean art showed extraordinary power and vigor, less knowledge and accuracy than that of the Egyptian, but greater artistry; animals and plants were delightfully rendered.
- D. **Greek and Roman Painting: 2628, 1529.**
  - a. **Greek:** An art which we can judge only from the descriptions of ancient writers who tell of the fine work of Polygnotus, the reputed founder of Greek painting, of Zeuxis, Parrhasius, Apelles, and others.
  - b. **Roman:** The great masterpieces of Roman painting, too, are lost to us, and only mural paintings preserved at Pompeii and elsewhere remain. They show that the art of the Augustan Age gave local color, natural flesh tints, and rounded modeling to figures. Although the Greek art was their model, it is believed that the Romans developed more originality in painting than in sculpture.

III. POST-ROMAN AND PRE-RENAISSANCE PAINTING:
- A. **Early Christian: 2628.** Crude religious decorations painted by persecuted Christians on the walls of the catacombs and later on walls of churches; an attempt to adapt ancient art to religious subjects.
- B. **Byzantine: 2628, 552.** Stiff and inexpressive but richly colored paintings and illuminated religious books overlaid with gorgeous conventional ornament and gleaming mosaics. Examples: 2630.
- C. **Medieval and Gothic: 2628.** A period when the painter, as a rule, was an artisan employing his highest skill in following the instructions of the clergy who ordered religious paintings and dictated costume, pose, and composition.

IV. ITALIAN PAINTING AND THE RISE OF THE SCHOOLS: **2628, 2996, 2108.**
- A. **Florentine School:** These artists were the first to paint from Nature; they acquired also the mastery of Perspective (2740) and developed technique in Oil Painting.
  - a. **Early Renaissance (14th Century):** Cimabue, a half legendary figure, and his great pupil Giotto, who is looked upon as the head of the Florentine School, stand at the dawn of this period 1461, 2628; among the greatest of the "Giottesques" was Andrea di Cione, who called himself Orcagna.
  - b. **Later Renaissance (15th and 16th centuries): 2629.** Fra Angelico; Masaccio; Botticelli; Fra Filippo Lippi 2108; Uccello, Verrocchio, Ghirlandajo, Fra Bartolommeo, and Andrea del Sarto 2629-30. These are some of the great Florentine names before the school reaches its climax in the High Renaissance with the work of Leonardo da Vinci 3643 and Michelangelo 2220.
  - c. **Typical Examples of the Florentine School:** A fresco of Giotto's 2631; Leonardo da Vinci's 'Mona Lisa' 1203.
- B. **Venetian School: 2629, 2630.** Not the exquisite Florentine line, nor the intellectual mysticism of Florence, but sumptuous vibrant color that reflected the gay and brilliant life of the Venetians marked the painting of this school.
  - a. **Great Artists:** Carpaccio, Gentile, Giovanni Bellini, Giorgione, Titian 3504, Paul Veronese, and Tintoretto.

b. **Typical Examples:** Titian's 'The Assumption of the Madonna' 3505, portrait of Philip II 2763; Veronese's 'Family of Darius at the Feet of Alexander the Great' 2641.

C. **Sienese School:** While this school perhaps surpassed the Florentine in poetry and tenderness, works of the first rank were rare, for it produced too quickly and too abundantly. Early in the 15th century it had begun to decline.

D. **Umbrian School: 2629.** The heir of the Sienese School produced an art full of freshness and poetry but somewhat limited and childish. Its two great masters were Perugino and Pinturicchio.

E. **Raphael and the Roman School: 2976.** The work of Perugino's great pupil, Raphael, was divided into three periods, the Umbrian, the Florentine, and the Roman. At Rome he became the head of a large school and held a veritable court. His successor Giulio Romano or "Jules Romain" was an able and prolific imitator whose work marks the beginning of Italian Decadence. Typical Examples: Raphael's 'Madonna of the Chair' 2109, 'Sistine Madonna' 2635; Romain's 'Dance of Apollo and the Muses' 156.

F. **Other Italian Schools and Masters:** In the late 15th century Padua produced a mighty genius Mantegna, whose work had a marked influence on Venetian art 2629; the glory of Parma was Correggio 2630; and many other towns produced lesser masters. The Bolognese or Eclectic School was one of incipient decadence (Example of its art: Guido Reni's 'Aurora' 259). Contemporary with it was the Naturalist School led by the fierce Caravaggio, painter of violent episodes of real life, and the romantic Neapolitan landscape painter, Salvator Rosa.

V. **THE NORTHERN SCHOOLS: 2630.** The Northern painters pursued no visions of ideal beauty; they painted the world they saw about them in realistic style.

A. **Flanders: 2630.** Minute careful exactness, rich color, and homely dignity characterized the best Flemish painting.

a. **Great Artists:** The Van Eycks; Memling who led the school at Bruges; Quentin Matsys; Rubens, the Titian of the North 3076; Rubens' great pupil Van Dyck 3618; Teniers; Van der Weyden; and others of lesser rank.

b. **Typical Examples:** 'William of Orange and Mary' by Van Dyck 2636; Van Dyck's Portrait of Himself 3618; 'Dedication of Decius Mus' by Rubens 2640.

B. **Germany: 2630.** German art at its best shadowed forth mystic imaginative aspirations through the medium of a harsh, uncompromising realism.

a. **Noted Painters:** Two great artists of the 16th century stand out above all others in the history of German painting—Albrecht Dürer 1048, and Hans Holbein 1672.

b. **Typical Example of German Art:** Holbein's 'Erasmus' 2636.

C. **Holland: 2631.** In the early 16th century a very individual school of Dutch painting arose, led by Lucas van Leyden whose work heralds the development of familiar art in Holland. In the 17th century Holland not only gave to the world one of the heroes of art, Rembrandt, but discovered a new world of subjects for painting, scenes of everyday life or "genre."

a. **Noted Painters:** Rembrandt, who began a new era by subordinating line and color to the subtle fleeting elements of light and shade 2994; Gerard Douw (Dou or Dow), Ferdinand Bol, and Jan Ver Meer, important members of Rembrandt's school; Frans Hals, who ranked not far below Rembrandt as a portrait painter 1566; Jan Steen, Adrian and Isaac Ostade, genre painters, as were most of Rembrandt's school; Meindert Hobbema and Jacob Ruysdael, landscape painters; Paul Potter, noted as an animal painter; and Albert Cuyp, who excelled in both landscape and animal paintings.

b. **Typical Examples:** 'Portrait of an Old Woman' by Rembrandt 2639; Rembrandt's Portrait of Himself 2994; 'The Banquet of the Arquebusiers' by Frans Hals 2640; 'Avenue of Middleharnis' by Hobbema 2637.

VI. **SPANISH, FRENCH, AND BRITISH PAINTING DOWN TO 1800:**

A. **Spain:** The natural tendency of early Spanish artists was toward an ascetic style. They painted emaciated Virgins and Christs. The influence of the Italian Renaissance did much toward establishing a more natural art, and finally in the work of Velasquez, Spanish painting was released from the grip of Spanish mysticism.

a. **Noted Painters:** José di Ribera, called by the Italians Lo Spagnoletto—the Little Spaniard—who deserted his native country to become the disciple of Caravaggio in the Neapolitan Naturalist School; Velasquez 3619; Murillo, another of the world's great masters 2370; the bold and versatile Goya, the last great Spanish painter until Fortuna in the middle of the 19th century.

b. **Examples of Spanish Painting at Its Best:** Portrait of Don Balthasar Carlos by Velasquez 2636: 'Immaculate Conception' of Murillo 2371.

B. **France:** For three centuries painting in France was largely a court luxury, and for the first two of those centuries mainly an importation from Flanders and Italy. The classical landscape was a French development (2631). Vast grandiose classical compositions were produced in the reign of Louis XIV. Then the keynote changed to frivolous gayety and elegance. By contrast the "back-to-nature" philosophy of Rousseau expressed in paint in the work of Greuze and Chardin pleased the fastidious taste of an artificial age.

— **Noted Painters:** Nicolas Poussin, first notable French painter 1202; Charles Le Brun, court painter to Louis XIV; Claude Lorrain, the "discoverer of sunlight," who developed the classical landscape 2631; Antoine Watteau, one of the world's great masters, in whose work French elegance and vivacious charm find their first expression; Nattier, painter of the great ladies of Louis XV's

court; Boucher and Fragonard, in whose work beauty tends toward mere prettiness; sentimental Greuze and unaffected modest Chardin, painters of humble bourgeois subjects; Mme. Vigée-Lebrun 1203 (picture).

C. **Great Britain: 2631.** British art was chiefly influenced by Flemish and German styles. Not until the 18th century did any great British painters appear.
   a. **Chief 18th Century Painters:** Hogarth "most forcible and exact exponent of his own rough land and time" 2631; the courtly group of great portrait painters, Reynolds, Gainsborough, and Romney, with Raeburn, Hoppner, Lawrence, and others of less importance, who form a bridge to the 19th century; Morland, first of English genre painters; and visionary William Blake.
   b. **Examples of Their Work:** Gainsborough's portrait of Mrs. Siddons 2636; 'Serena' by Romney 2981.

VII. **MODERN PAINTING: 2631.** In the 19th century France assumed the position of teacher in the graphic fine arts that had been held earlier by Italy. Most of the modern movements in painting have radiated from Paris. England, however, claims a notable school of landscape painting headed by Constable and later by the great Turner, and the Pre-Raphaelite movement (2632) was born and died in that country. In France the revolutionary classicism of David and Ingres was followed by the Romanticism of Gericault and Delacroix, and that by the Barbizon School (2632), the realism of Courbet, the semi-classicism of Cabanel, Bouguereau, and Gérôme, and Impressionism (2632). This in the main sums up the tendencies in painting down to the Post-Impressionism, Cubism, and Futurism of our own day (2633).

A. **Chief French Painters and Their Works:** Corot, exquisite painter of nature 892 ('Dance of the Nymphs' 1245); Millet, great painter of French peasant life 2239 ('The Angelus' 2638); Rosa Bonheur, gifted animal painter 453 ('Plowing in Nivernais' and 'The Shepherd of the Pyrenees' 453); Edouard Manet, father of the Impressionist School 2633; Jules Breton, a painter of peasants ('Song of the Lark' 421); Cézanne, Gauguin, and Matisse, of the Post-Impressionist group.

B. **Noted British Painters and Their Works:** John Constable 2631, J. M. W. Turner 3561 ('The Fighting Téméraire' 1246); Ford Madox Brown, who largely inspired the Pre-Raphaelite School ('Chaucer Reading the First Great English Poem at Court' 703); Rossetti, Hunt, Millais, and Sir Edward Burne-Jones ('The Mill' 2638) of the Pre-Raphaelite School; G. F. Watts, painter of portraits and allegorical pictures ('Sir Galahad', frontispiece Volume 6); Sir Edward Landseer, animal painter 1960 ('The Old Shepherd's Chief Mourner' 2641); Lord Frederick Leighton ('The Return of Persephone to Her Mother' 992); Sir Lawrence Alma-Tadema ('Sappho Listening to the Music of a Lyre' 1534, 'A Reading from Homer' 3542).

C. **Spanish Painters:** Zuloaga and Sorolla ('Hitching Oxen to the Boat' 2632).

D. **Painters of the United States: 2634.** Benjamin West, historical and religious painter; John Singleton Copley, Charles Wilson Peale, Gilbert Stuart, Thomas Sully, portraitists; Thomas Cole, landscape painter, leader of the Hudson River School; William Morris Hunt, pupil of Millet; George Inness, America's first great landscape painter ('Autumn Oaks' 2637); Winslow Homer, marine painter; John La Farge; Edwin Austin Abbey ('King Arthur and His Knights' 224); James McNeill Whistler, America's most famous painter, who lived abroad and headed the Impressionist School in England; John Singer Sargent, portrait painter ('Frieze of the Prophets' 2923).

# Music

I. NATURE OF MUSIC:

A. **Physical Basis of Music: 3278.** See also the section on Sound in the Physics Outline.

B. **Three Elements of Music: 2378.**
   a. **Rhythm:** The regular recurrence of tone groups in which the individual notes are symmetrically arranged according to accent and time value.
   b. **Melody:** A succession of simple tones constituting a musical phrase.
   c. **Harmony:** The musical element that has to do with the simultaneous blending of sounds called "chords."

C. **Written Music: 2377.**
   a. **Staff and Notes: 2376** (picture).
   b. **Time in Music: 3502.**

II. SOME IMPORTANT FORMS OF MUSICAL EXPRESSION: **2378.**

A. **Suite: 2378.** A composition originally intended for one instrument, now often written for an orchestra.

B. **Sonata: 2379.** An instrumental composition in three or four movements.

C. **Concerto: 2379.** A composition in sonata form for a solo instrument and the orchestra.

D. **Symphony:** A sonata for an orchestra.

E. **Oratorio:** A semi-dramatic sacred choral work of large scope with vocal solos and orchestra accompaniment

F. **Opera: 2584.** A musical form of drama with solos, choruses, orchestra accompaniment, scenery, and acting.

G. **Cantata:** A composition either sacred or secular for solo voices and chorus; shorter than an Oratorio or Opera.

H. **Anthem:** A composition in common use in church services; sometimes for full choir throughout or for two choirs, and sometimes with solo parts introduced; an organ accompaniment is usually written.

I. **Hymn:** A form of composition used in religious services; it varies considerably in measure owing to the variety of meters used in the words.
J. **Canon:** A composition in which one part follows another over the same notes, separated perhaps by an octave, but exactly imitating its movement.
K. **Rondo:** A bright movement in which the principal subject keeps recurring, always in the same key.
L. **Fugue:** A movement beginning with a subject in single notes which is given out by one part and answered by other parts in turn, the subject and counter-subjects being woven into a harmonious whole.

III. MUSICAL INSTRUMENTS: **2381.**
A. **Stringed Instruments: 2381.** Piano 2797; Harp 1589; Violin (Viola, Violoncello, and Double Bass) 3645; Guitar 1548; Mandolin 2135; Banjo 326; Ukulele 3575.
B. **Wind Instruments: 2383.**
a. **Woodwind Instruments: 3781.** Flute, Piccolo, Fife, Oboe, English Horn, Bassoon, and Clarinet.
b. **Brasses: 1680.** French Horn, Trumpet, Cornet, Trombone, Tuba, Saxhorn, and Saxophone.
c. **Minor Wind Instruments: 2383:** Accordion, Bagpipe, Jew's Harp, Harmonica, Ocarina.
C. **Percussion Instruments: 2383.**
a. **Drums: 1042.** Kettledrum, Bass Drum, and Snare Drum.
b. **Bells:** Triangle, Glockenspiel, Xylophone, Celesta, Cymbals, etc.
D. **Orchestra: 2590.** Group Use of Instruments.

IV. HISTORY OF MUSIC:
A. **Hebrew Music: 2376.**
B. **Greek Music: 2376.**
C. **Development from the 4th to the 17th century A.D.: 2377.**
a. **Guido of Arezzo and the Invention of the Musical Staff: 2377.**
b. **Rise of Secular Music: 2378.**
c. **Development of Counterpoint: 2378.**
d. **Palestrina and the Perfection of the Mass: 2378.**
D. **Great Modern Composers and Their Contribution to the Development of Music:**
a. **Johann Sebastian Bach: 300.** The world's most profound and original musical thinker and the link between medieval polyphonic and modern harmonic styles.
b. **George Frederich Handel: 1572.** Great master of the Oratorio.
c. **Christoph Willabald Gluck:** Reformer of the Opera and greatest writer of dramatic music before Mozart.
d. **Franz Joseph Haydn: 1609.** One of the earliest, if not the earliest, of the great masters of the symphony and the orchestra.
e. **Wolfgang Amadeus Mozart: 2363.** Universal genius in music, who raised all musical forms except the Oratorio and the Fugue to a point never reached before, and Comic Opera to a height "never since approached within classical limits."
f. **Ludwig Van Beethoven: 365.** Greatest Orchestral composer of the 19th century.
g. **Carl von Weber:** Founder of the Romantic School of German Opera.
h. **Franz Schubert: 3143.** "The first and perhaps the greatest classical song writer."
i. **Felix Mendelssohn: 2198.** Modern classical master, one of the earliest of moderns to appreciate and be influenced by Bach.
j. **Frederic François Chopin: 757.** A composer who created a new style of composition for the piano and added a new national element to music.
k. **Hector Berlioz:** Master of Impressionist orchestration.
l. **Robert Schumann: 3143.** Romanticist composer whose songs rank with those of Schubert and Mendelssohn and his "piano lyrics" with those of Chopin.
m. **Franz Liszt: 2026.** Pioneer of the symphonic poem.
n. **Giuseppe Verdi: 3628.** Greatest Italian composer of the 19th century.
o. **Richard Wagner: 3663.** Creator of a new form of music drama.
p. **Johannes Brahms:** One of the great masters.
q. **Peter Ilyitch Tschaikovsky: 3546.** Greatest of Russian composers.
r. **Antonin Dvorak:** A composer who made extensive use of folk-melodies, especially of Slavic origin.
s. **Richard Strauss: 3369.** Musical realist and lyric master, most sensational of modern composers.

# Picture Studies in the Fine Arts

## ARCHITECTURE

How History is Written in Letters of Stone—From the Pyramids of Egypt to the Skyscraper 178-9.
The Keystone and the Arch 174.
How Egyptian Bricks were Molded 503.
Temple at Karnak, Egypt 1101, 1105.
An Egyptian Pylon 1104.
The Beautiful Ruins of Philae 1106.
The Building of the Great Pyramid 2939.
Three Great Tombs the Pharaohs Built 2940.
The Hanging Gardens of Babylon 3179.
The Royal Residence of an Assyrian King 295.
Alexandria in the Days of Its Glory 87.
Pharos of Alexandria 3179.
In Antiquity's Greatest Library 1992.
The Famous Pompey's Pillar 88.
Crowning Glories of Ancient Architecture 176.
The Three "Orders" of Greek Architecture 180.
The Acropolis Now and in the Days of Pericles 1517, 250, 11
Ancient Greek House 1521.
Temple of Diana at Ephesus 3179.
A Ruined Memorial of the Days of the Greeks, Sicily 3229.
The Most Famous Tomb of Ancient Times 1531.
A Roman Aqueduct 163.
The Temple of All the Gods at Rome 181.
Colosseum at Rome 181.

A View of the Ruins of Pompeii 2875.
The Cheerful Pompeian Homes of Those Old Days 2877.
Splendors of Rome, Ancient and Modern 3051, 3055.
The Forum of Rome, Then and Now 3053.
The Baths of Caracalla at Rome 3057.
Castle Sant' Angelo, Rome 3054.
The Arch of Augustus at Rimini, Italy 1840.
Santa Sophia, the "Jewel Box" of Constantinople 182, 183.
Cathedral of St. Mark, Venice 1197, 182.
A Famous Church at Jassy, Rumania 3082.
The Leaning Tower and Cathedral of Pisa 2811, 184.
The Baptistery at Pisa 1848.
Taj Mahal, a Beautiful Dream in Marble 3431.
A Tomb as Beautiful as a Jeweled Crown, Agra, India 1754.
Island Palaces in Lake Pichola, India 1755.
Delhi's "Perfect Tower" 989.
The Great Mosque of Shah Jehan at Delhi 990.
Azhar Mosque at Cairo 569.
Mosque at Constantinople 2276.
One of the Famous Porcelain Gates at Teheran, Persia 2736.
The Alhambra 3298.
Plan of a Medieval Castle 655.
Carnarvon Castle in Wales 3665, 656.
A Frowning Castle of the Tyrol 270.
The Gothic Vault 187.
Notre Dame, the Queen of French Cathedrals 185, 186.
Plan of Medieval Church 186.
The Gothic Cathedral of Amiens 117.
Basilica of St. Anthony at Padua 1846.
Duomo and Bell Tower at Florence 1834, 1294.
Giotto's Tower 1462.
Cathedral of Milan 1843, 1199.
Cologne Cathedral and Its Heaven-Pointing Spires 834.
Cloth Hall at Ypres, Belgium 3834.
Westminster Abbey 2049, 3719.
Melrose Abbey, Scotland 2298.
Canterbury Cathedral 637.
Beautiful Hampton Court Palace, England 1154.
St. Peter's at Rome—The Church of Churches 187.
The Courtyard of the Palazzo Vecchio, Florence 1849.
St. Paul's Cathedral at London 2048.
The Louvre, Paris 1203, 1200.
One of the Old Gild Houses 1459.
Franciscan Mission at San Luis Rey, California 2301.
The Leland Stanford Junior University 581.
Washington's Home at Mount Vernon 2358.
The Historic Executive Mansion of the United States 3734.
The Historic State Capitol of Delaware 988.
The Pennsylvania Station in New York City 2496.
Houses of Parliament, London 2049.
Harper Memorial Library, University of Chicago 1734.
Canadian Parliament House 621.
A Modern Skyscraper 188.
The Woolworth Building at Night 2489.
A Skyscraper on the Way Up 529.
The Use of "Liquid Stone" 530.
Pouring a Whole Building into Molds 531.
Chinese Wall 741.
The "Front Gate" of Peking 2707.
An Ancient Temple at Peking 2708.
A Church in Burma That Rocks with the Wind 541.
The Temple of Buddha in a Cave 525.
The Great Pagoda at Tanjore, India 1753.
The Dream-Like "Hall of the Winds" at Jaipur, India 1742.
Architecture in Syria 3425.
Temple of the Sun at Palmyra, Syria 2648.
In the Ancient Capital of the Incas 1741.
Buildings That Tell Us of Mexico's Vanished Civilizations 289.
Sun-dried Brick Dwellings of the Pueblo Indians 1766.
American Indian Architecture at Its Best 1774.
Architecture of the Hunting Tribes of American Indians 1770.
Ruins of Cliff Dwellings 793, 844, 205.
Cliff Dwellers' Temple of the Sun 794.
In the Library of the Popes 2665.
The Spanish Royal Palace 2110.
A Royal Castle of Portugal 2888.
Bell Tower, Hungary 1702.
The Historic Kremlin at Moscow 2332, 3095.
"Holy Moscow," Mother City of all the Russias 3093.
Church in Petrograd Showing Oriental Influence Typical of Russian Architecture 3092.
The Hermitage at Petrograd 3090.
The Famous Theater at Weimar 1443.
Architecture in Nuremberg 2543.
Trinity Column in the Graben, Vienna 3642.
Historic Buildings in Picturesque France 1342.
The Great Arch of Triumph, Paris 2681.
The French National Opera, Paris 2683.
In the Luxembourg Gardens, Paris 2684.
The Mint Tower in Amsterdam 119.
The Peace Palace at The Hague 1558.
The Great Bell Tower of Bruges 519.
Trafalgar Square and the Nelson Monument, London 2052.
Architectural Beauties of Oxford 2609, 2610, 2611.
Palace of the Fine Arts at Rio de Janeiro 3288.
A Presidential Palace in Rio 3289.
Municipal Building in Panama City 2649.
The Great Cathedral of Mexico City 2217.
The United States Capitol at Night 3681.
America's Largest Library 3682, 1993.
"The Great White Shaft," Washington, D. C. 3685.
The Beautiful Lincoln Memorial in Washington 2011.
The Great Boston Public Library 470.
The Imposing Capitol at Albany, New York 2482.
The Mother Church of the Christian Science Faith 1081.
Who Says That Cities Have No Souls? 769.
A Civic Center Worthy of Cleveland's Greatness 792.
One of Chicago's Many Churches 725.
The New Capitol of Nebraska 2431.
Mormon Temple, Salt Lake City 3118.
The Capitol of Texas 3476.
Magnificent Chateau Frontenac, Quebec 2949.
The Birth of a Modern Lighthouse and Its Structure 2005.

## SCULPTURE

Relics of Aztec Art 2216.
Carved Pipes of Iroquois Indians 1766.
An Alaskan Totem Pole 74.
The Mysterious Stone Men of Easter Island 2619.
The Avenue of the Sphinxes Today 1103.
The Great Sphinx Watches the Centuries Pass 3316.
Statues of an Egyptian Official and His Wife 1206.
Head of Ptolemy Auletes 1206.
Sculpture from the Egypt of 4000 Years Ago 3155.
Statues of Amenhotep III 1105.
Statue of Rameses II 1106.
An Assyrian Animal Sculpture 296.
Assyrian Soldiers of the Empire 296.
A Sumerian Sculpture 297.
Assyrian Winged God 1206.
Assyrian Winged Bulls 1206, 3155.
An Ancestor of the Venus de Milo 1530.
The Famous Behistun Rock 2739.
'Discus Thrower' 1204.
Phidias' Statue of Jupiter 3179.
Figures from the Frieze of the Parthenon 1532, 1206, 248.
Clinging Cloth Carved from the Solid Stone, Figures from the Parthenon 1525.
'Venus de Milo' 1203, 155.
'Hermes Carrying the Young Dionysus' by Praxiteles 3156.
Statue of Athena from Acropolis 248.
'Villa Ludovisi Mars' 1530.
'Artemis of Gabii' 1203.
Colossus of Rhodes 3179.
The 'Apollo Belvedere' 3159, 156.
Statue of Diana 1205.
Greek Statue of Flora 1204.
'The Wrestlers' 1205.
'The Young Augustus' 1532.
Heroic Figures in the History of Rome 3043.
Figures in Relief on Trajan's Column 1533.
Scene from a Roman Sarcophagus of the First Century A. D. 3156.
Bronze Horses of San Marco, Venice 1852.
Pisano's Pulpit 1201.
Ghiberti's Bronze Doors 1457.
'St. Cecelia', A Master Work in Bas-Relief 3157.
'Singing Galleries' by Lucca della Robbia 3160.
Statue of Colleoni by Verrocchio 1204.
Michelangelo's 'Giuliano de' Medici' 3159.
'Lorenzo de' Medici' by Michelangelo 2191.
'The Descent from the Cross' by Michelangelo 2220.
The Majestic 'Moses' by Michelangelo 2222.
'Flying Mercury' by Giovanni da Bologna 3159.
'Perseus with the Head of Medusa' by Canova 3159.
'George Washington' by Houdon 3161.
'Theseus Slaying the Centaur' by Barye 3160.
'The Neapolitan Fisherboy' by François Rude 3162.
'Joan of Arc' by Henri Chapu 3162.
Bartholdi's Statue of Liberty 2488.
Some Famous Sculptures by Rodin 3037.
Bust of J. P. Laurens by Rodin 3162.

'Cupid' by Marqueste 940.
'The Hammerman' by Meunier 3161.
'Teucer' by Thornycroft 3161.
'The Young Alcibiades Learns Wisdom from Socrates' by Harry Bates 3271.
'Lincoln' by Saint-Gaudens 3161.
Lorado Taft's 'Fountain of Time' 723.
'The Blind' by Lorado Taft 3163.
'North America' by Gutzon Borglum 109.
'South America' by Isadore Konti 109.
'Buffalo Group' by Preston Powers 3163.
'Her Son' by Nellie Verne Walker, Frontispiece, Volume 7.
'Gaspard de Coligny' 826.
'Cortez and the Cross' 895.
The Spirit of Champlain in Bronze 622.
Statue of George Washington in London 2055.
'Echo' by Herzig 1074.
The Giant Bull of Siva 1749.
Ivory Carving in Japan 1873.
The Sacred Lions of Java 1877.
The Great God Buddha in Many Moods 638.
Image of Buddha 1876.

## PAINTING

Examples of the Caveman's Art 666, 668.
The Art of the Stone Age People 2628.
The Aztec God of the Winds 290.
Hopi Indian Gods 1769.
One of the Weird Funeral Ceremonies of the Egyptians 1102.
Egyptian Wall Painting More Than 3000 Years Old 2629.
A Byzantine "Painting" Made from Bits of Colored Glass 2630.
Benedictine Monk, from a Drawing Made by the Monks of the Middle Ages 2298.
An Old Portrait of Magellan 2116.
'Mona Lisa' by Da Vinci 1203.
Da Vinci's 'The Last Supper,' One of the World's Supreme Masterpieces 3643.
'Christ Washing the Feet of the Apostles' by Giotto 2631.
'Philip the Second of Spain' by Titian 2763.
'The Assumption of the Madonna' by Titian 3505.
'Family of Darius at the Feet of Alexander' by Veronese 2641.
'Sistine Madonna' by Raphael 2635.
'The Dance of Apollo and the Muses' by Jules Romain 156.
'Aurora' by Guido Reni 259.
'Dedication of Decius Mus' by Rubens 2640.
Van Dyck's Portrait of Himself 3618.
'William of Orange and Mary' by Van Dyck 2636.
Portrait of Erasmus by Holbein 2636.
'Portrait of an Old Woman' by Rembrandt 2639.
Rembrandt's Portrait of Himself 2994.
'The Banquet of the Arquebusiers' by Frans Hals 2640.
'Avenue of Middleharnis' by Hobbema 2637.
The 'Immaculate Conception' by Murillo 2371.
Portrait of Don Balthazar Carlos by Velasquez 2636.
Le Brun's Portrait of Herself and Daughter 1203.
Portrait of Mrs. Siddons by Gainsborough 2636.
'Serena' by Romney 2981.
Corot's 'Morning' or 'The Dance of the Nymphs' 1245.
'The Angelus' by Millet 2638.
'Plowing in Nivernais' by Rosa Bonheur 453.
'The Shepherd of the Pyrenees' by Rosa Bonheur 453.
'Song of the Lark' by Jules Breton 421.
'Satan Plotting Man's Downfall' by Doré 2245.
'The Charge of the Cuirassiers' by Morot 1352.
'The Fighting Téméraire' by Turner 1246.
'The Mill' by Burne-Jones 2638.
'Orpheus and Eurydice' by George Frederick Watts 2602.
'Sir Galahad' by George Frederick Watts, Frontispiece, Volume 6.
'The Return of Persephone to Her Mother' by Sir Frederick Leighton 992.
The Famous Painting 'Wedded' by Sir Frederick Leighton 2152.
Landseer's Painting of Himself with His Dogs 1961.
'The Old Shepherd's Chief Mourner' by Landseer 2641.
'Chaucer Reading the First Great English Poem at Court' by Ford Madox Brown 703.
'Sappho Listening to the Music of a Lyre' by Alma-Tadema 1534.
'A Reading from Homer' by Alma-Tadema 3542.
'Atalanta's Race' by Edward J. Poynter 247.
'King Henry's Prayer Before the Battle of Agincourt' by Sir John Gilbert 1635.
'And Ruth Said, "Entreat Me Not to Leave Thee",' by Philip Calderon 3101.
'Hitching Oxen to the Boat' by Sorolla 2632.
'The Age of the Reformation and the Renaissance' by Wilhelm von Kaulbach 2988.
'Christ in the Temple' by Heinrich Hofman 1887.
'Autumn Oaks' by George Inness 2637.
'The Edict of William the Testy' by George H. Boughton 1831.
'The Goddess of the Tides' by John Elliott 221.
'King Arthur and His Knights of the Round Table' by Edwin A. Abbey 224.
The Bizarre Effects of 20th Century Cubism 2633.
How Animal Painters Do Their Work 1244.

## MINOR FINE ARTS

A Stone Age Bowl 3360.
Relics of the Bronze Age 515.
A Doll from Egypt 1026.
Aegean Art 1000 Years Before Christ 28.
Relics of the Days of Ancient Greece 1524.
How the Greeks Decorated Pottery 1527.
Ancient Roman Tools and Utensils 3045.
A Doll of Old Rome 1026.
A Splendid Example of Chinese Enamel 1146.
An Ancient Piece of Cloisonné 1146.
What True Artists Can Do with Enamel 1147.
A Chinese Porcelain Vase 2881.
Rare and Valuable Specimens of Fine Porcelain 2882.
A Japanese Print 1875.
Japanese Workers in Hammered Metal 1869.
A Masterpiece of Japanese Art in Bronze 1874.
The Art of the Silversmith 3241.
Turning a Vase 2903.
The Evolution of a "Thrown" Vase 2904.
Molding Beauty Out of Clay 2907.
A Painter Ornamenting a Rookwood Vase 2906.
Portland Vase 1206.
Borghese Vase 1203.
Silver Pitcher by Cellini 1205.
First Step in Making an Illustration for This Book 1169.
Final Step in Making the Illustration 1171.
A Diamond Cutter at Work 1004.
Old and New Styles in Diamonds 1004.
Thomas Chippendale Working on a Table 1383.
Examples of Chippendale Furniture 1384.
An Adam Room 1385.
A Corner in a Sheraton Room 1385.
The Life of Diana Told in Tapestry 3435.
Submarine Plants Made of Glass 1474.
Two Beautiful Specimens of Old Lace 1950.
Navajo Doll 204.
Weaving Navajo Blankets 206.
Apache Baskets 342.
A Pueblo Indian Drilling a Turquoise 2933.

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The Indian Book. Edited by Nathalie Curtis Burlin.
Afro-American Folk Songs. Henry E. Krehbiel.

# Interest-Questions in Art and Literature

How do the pyramids show they were built by slaves? 176.
Who designed the dome of St. Peter's at Rome? 2222.
What keeps an arch from falling? 174.
How can a dome be put over a square room? 178.
How did tents affect Chinese architecture? 747 (picture).
What is the entablature of a building? 177.
Why were Romanesque churches heavy and dark? 181.
What are flying buttresses? 184.
Why is the pointed arch used in Gothic architecture? 186, 187 (picture).
What is "baroque" art? 188.
Why would Gothic architects have liked sky-scrapers? 189.
What ancient people would not use arches in buildings? 177.
How did the geography of Greece influence Greek art? 1529.
Where was the first mausoleum? 1531.
What is "relief" in sculpture and what is its opposite? 3154.
What is the statue that sang? 1105 (picture).
Why were the Romans not as great artists as the Greeks? 1533.
What great sculptor spent his early years in the Bowery district of New York? 3107.
Who made the Statue of Liberty? 3158.
Were Greek statues all white? 1529.
What ancient statue was called "the Rule"? 1530.
What had athletics to do with Greek sculpture? 1529.

What kind of art did the cavemen have? 668.
Who were the great animal painters 20,000 years ago? 2627.
How do we know the Greeks were painters although they have left us no paintings? 1529.
Where were the first Christian paintings made? 2628.
What painter began by drawing his father's sheep? 1461.
What is perspective in painting? 2628-9, 2740.
What was the origin of the expression, "as round as Giotto's 'O' "? 1461–2.
What great Italian master wrote his manuscripts from right to left? 3643.
What smile has puzzled the world for over four centuries? 3644, 1203 (picture).
Why do early paintings look flat? 2631 (picture).
What Flemish artist became leader of the English school of portrait painters? 3618.
Who is called "the painter's painter"? 3620.
What famous picture was sketched on a wine cask cover? 2976.
What artist had a menagerie? 453.
What is a "fresco"? 2629.
What is "distemper" in painting? 2629.
Who was "the faultless painter"? 2630.
What is genre? 2631.
What is "impressionism"? "Post-impressionism"? 2633.
What is "cubism"? 2633.
What American artist painted with his left hand after losing the use of his right? 2634.
What musician became blind through straining his eyes when a boy copying music by moonlight? 300.
What composer became deaf at the height of his success? 366.
What musician began to compose at the age of five? 2363.
What did an injury to his hand have to do with the making of a famous German composer? 3143.
When was the violin invented? 3646.
When was the first piano made? 2797.
How did the piano get its name? 2797.
What are the three families of musical instruments? 2381.
What are the most famous doors in the world? 1457, 1848.
What great tower has a picture of the artist's dog among its sculptured figures? 1847.
How do fine arts and useful arts differ? 1242.
What Frenchman burned his furniture to make pottery? 2906.
What four horses were made twenty centuries ago? 1852.
What people were the first to leave written music? 2376.
Why do we sing "Do, Re, Mi, etc."? 2377.
What was the first musical publication in America? 2379.
How did gypsy music become great? 2026.
What is a "sonata"? 2378, 2379.
Who was the "father of English poetry"? 702.
What poet earned his way through Europe by his flute? 1483.
What poet whose fame depends chiefly on a humorous poem had a tragic life? 910.
Who was the "ploughboy poet"? 542.
What valuable manuscript was found by its author when looking for fishing tackle? 3151.
What great literary work was burned by a servant-maid? 644.
What two poets were united by "the most beautiful romance of literary history"? 517.
What English poet was the son of livery-stable keeper? 1914.
What English writer intended to reform the world, but is remembered only for his poetry? 3204.
Who was the poet who said of himself "I awoke one morning to find myself famous"? 551.
Who were the "Lake Poets"? 825.
What English poet died while fighting for the freedom of Greece? 551.
What great poem was written on the death of a poet by another poet who himself died shortly after? 3204.
What long English poem, completed after 17 years, was inspired by grief at the death of a friend? 3470.
What great religious allegory was written in prison? 534.
Who was the "real Robinson Crusoe"? 933.
What book written as a cutting satire on human nature has become a children's classic? 3406.
What English writer was leader of a literary club? 1899.
What English writer of the 18th century remains a great literary figure though his works are now little read? 1899.
To what writer was it said, "If you could make little fishes talk, they would talk like whales"? 1899.
What celebrated English novelist began work in a blacking factory? 1006.
What famous children's story was written by an old bachelor who was a professor of mathematics? 647.
What Scotch writer developed his gift of humor through trying to make his mother laugh? 333.
What famous poem on death was written by an American boy of 17? 521.
What American writer lived happily on 27 cents a week? 3492.
What famous narrative poem was based on legends of the North American Indians? 2057.
What poem saved a ship from destruction? 1674.
What American poet was also a prominent physician? 1674.
What American novel helped to bring about a war? 3368.
What novelist is called "the American Scott"? 878.
How did the "novel" get its name? 2539.
How did "Mark Twain" get his name? 3569.
Who was called "Dean of American Letters"? 1689.
How did an American essayist learn to write by going a-fishing? 543.
What was the original meaning of "pageant"? 1033 (picture).
How many actors were there in the Greek drama? 1032.
Why are the "Romance" languages so called? 3040.
What great orator of antiquity was born with an impediment in his speech? 993.
What great Spanish novelist was sold into slavery? 682.
How are religion and drama connected? 1031, 1033.
What world language did not have to be invented? 1965.
What great English story-teller waged a constant battle against death? 3355.
What popular children's book was written for a school textbook? 1957.
What Russian writer gave up his wealth and lived as a peasant? 3512.
What great German writer foreshadowed the theory of evolution? 1478.
What French writer was called the "knight errant of history"? 1375.

# AGRICULTURE

IT was a great day in the history of the human race, when some ancient nomad hunter first decided to settle down and begin scratching the soil with a sharp stick so it would grow crops for him. Primitive men themselves realized dimly what a momentous change this meant for them, and later generations wove legends about the god, like Osiris, or the semi-divine hero, like Cadmus, who came among men to teach them agriculture and raise them out of savagery. Gradually men added one food plant after another to their stock; they learned to domesticate animals; they grew flax and clipped the wool of their sheep that wives and daughters might spin and weave clothes for the household. Meanwhile the sharpened stick had given away to the plowshare; and the forward march of human culture was measured by the improvements in Agriculture. To this day, despite all the other vast industries that have grown up to serve us, Agriculture remains the foundation of civilization. Read first the article on Agriculture (43), then follow the Outline.

I. **SOIL: 3272.**
  A. **Essentials of Fertile Soil:** Moisture, Rainfall 2972; Chemical Elements 3273, 1235, 2777.
  B. **Artificial Treatment of the Soil:**
    a. **How Moisture is Supplied:** Irrigation and Drainage 1827–8, 954, 222; Dry Farming 641.
    b. **How Chemical Elements are Supplied:** Fertilizers 1235, 2898; Crop Rotation 2512, 48, 2511; Soil-Enriching Crops 1235 (Alfalfa 88, Clover 809, Soy Bean 3297).

**Note:** For soil formation and kinds of soil see the Physiography Outline page 3864.

II. DOMESTIC PLANTS:
- A. **Breeding and Propagation: 538.** Seeds and Seed Selection 3171–3, 1396 (picture), 890, 2901; Bulbs, Tubers, Rootstocks 532; Grafting 1377.
- B. **Grains:** Wheat 3730; Corn 888; Oats 2548; Rye 3102; Barley 330; Rice 3013; Buckwheat 524; Millet 2239.
- C. **Pasture and Hay Crops: 1609.** Grasses 1502, 3276, 1907; Clover 809; Alfalfa 88; Cowpeas 910; Soy Bean 3297.
- D. **Vegetables:**
  - a. **Legumes:** Beans 347; Peas 2698; Lentils 1988; Peanuts 2700.
  - b. **Bulbs, Tubers, Roots, and Rootstocks: 532.** Beets 365; Carrots 650; Parsnips 2691; Onions 2581; Potatoes 2900; Sweet Potato 3405; Turnips and Radishes 554.
  - c. **Other Vegetables:** Asparagus 234; Cabbage, Brussels Sprouts, Kale, Kohlrabi, Cauliflower, and Watercress 553; Celery 671; Cucumber 939; Eggplant (see Fact-Index); Lettuce, Okra (see Fact-Index); Pumpkins 2934; Rhubarb 3012; Spinach (see Fact-Index); Squash 3333; Tomato 3512.
- E. **Spices and Condiments: 3317.** Cloves 810; Ginger 1460; Mint 2257; Mustard 2385; Nutmeg and Mace 2544; Parsley 3319; Pepper 2723; Vanilla 3619.
- F. **Sugar 3385, 365, 2138; Coffee 820; Tea 3445; Tobacco 3508.**
- G. **Fiber Crops:** Cotton 901; Flax 1291; Hemp 1630; Jute 1905; Sisal 3244.
- H. **Fruits: 1377.**
  - a. **Common Orchard Fruits:** Apple 160; Apricot 161; Cherry 716; Mulberry 2365; Peach 2699; Pear 2701; Persimmon 2740; Plum 2840; Quince 2950.
  - b. **Small Fruits:** Blackberry 432; Blueberry 439; Cranberry 915; Currant 940; Gooseberry 1488; Grape 1501; Loganberry 2046; Raspberry 2977; Strawberry 3370.
  - c. **Tropical and Semi-tropical Fruits:** Banana 324; Breadfruit 501; Citron 769; Date 966; Fig 1237; Grapefruit 1499; Lemon 1985; Lime 2011; Mango 2135; Olive 2579; Orange 2588; Pineapple 2809; Pomegranate 2874; Raisin Grape 2974; Melons 2195.
- I. **Nuts: 2545.**
  - a. **Temperate Zone Nuts:** Butternut 548; Chestnut 718; Chinquapin 752; Hazelnut 1611; Hickorynut 1647; Pecan 2705; Walnut 3667.
  - b. **Tropical Nuts:** Almond 99; Brazil Nut 2545; Coconut 818.

III. LIVE STOCK AND LIVE STOCK PRODUCTS:
- A. **Stockraising and the Effects of Careful Breeding: 44, 49 (picture), 662, 950, 2911.**
- B. **Common Domestic Animals and Their Products:**
  - a. **Draft Animals:** Horse 1682; Mule 3300 (picture); Ass 235.
  - b. **Cattle and Hogs and Their Meat Products and By-Products: 662, 1670, 2181, 2185 (picture).**
  - c. **Sheep and Wool: 3198, 3782.**
  - d. **Goats: 1476.**
  - e. **Poultry: 2908.** Chickens and Eggs 2908; Turkey 3556; Duck 1044; Goose 1487; Guinea Fowl 1547; Pigeons and Doves 2803.
  - f. **Bees and Honey:** 359, 809, 524.
  - g. **Dairying and Dairy Products:** 949. Milk 2238; Butter 543; Cheese 708.
  - h. **Other Animal Products:** Hides and Skins 1975; Feathers 2603, 1046.
- C. **Domestic Animals Peculiar to Certain Regions:** Alpaca 100; Buffalo 527; Camel 588; Llama 2039; Reindeer 2993; Yak 3827; Ostrich 2603.

IV. ENEMIES AND FRIENDS OF THE FARMER:
- A. **Animal Pests:** Gophers 1488; Groundhogs 1543; Hen-Hawks 1605; Mice 2359; Rats 2977; Mongooses 2286; Prairie-Dogs 2912; Weasels 3707. Insects: Aphids 154; Army-Worms 218; Beetles 369; Butterflies and Moths 544 (Caterpillars 660); Codlin Moth 820; Cankerworms 630; Cutworms 944, Cicadas 764, Chinch Bugs 752, Grasshoppers 1503, Hessian Flies 1645, June Bugs 1902, Potato Bugs 2902, Scale Insects 3132, Weevils 3713.
- B. **Harmful Plants:** Weeds 3712; Dandelion 957; Morning Glory 2327; Poisonous Plants 2854; Thistle 3489; Rusts and Smuts 3099.
- C. **Farmers' Helpers:** Bats 345; Birds 400; Frogs 1373; Toads 3506; Moles 2278; Skunks 3246; Lady-Bugs 1955; Ichneumon Flies 1724.
- D. **Sprays and Spraying: 3330.**

V. POWER, MACHINERY, APPLIANCES:
- A. **Power:** Windmill 3749; Gas Engine 1403; Animal Power 1683, 235, 527, 2993.
- B. **Machinery: 43.** Plows 2839; Reaping Machines 2983; Threshing 3493.
- C. **Silos: 3240.**

## The Picture-Story of Agriculture

**The Beginnings of Agriculture 773.**
**How Farming was Conducted in the Middle Ages 44.**
**Why the Farm is the Greatest of All Factories 45.**
**Feeding the Fields that Give Us Bread 47.**
**Preparing the Soil for the Seed 47.**
**Bacteria—The Little Nitrate Factories 302.**
**How Alfalfa Farms Another Farm 89.**
**Preparing the Nitrates for Market 2512.**
**The "River System" of an Irrigated Orchard 1828.**
**A Typical Irrigation Plant of the West 1829.**
**One of the Greatest of Man-made Lakes 1830.**
**Water for the Thirsty Crops in Kansas 1910.**
**Irrigation Products of Idaho 1729.**
**How Colorado Gets Crops from Arid Lands 842.**
**The Great Roosevelt Dam 200.**
**In the Yakima Valley—A Man-made Paradise 3688.**

"Elephant Butte" Dam in the Rio Grande Valley 2464.
Along One of New Mexico's Many Irrigation Canals 2465.
The Egyptian's Bucket Wheel 1827.
Ancient Egyptian "Shadoofs" and the Thirsty Fields 1093.
Why Plants Get Sick 2821.
Luther Burbank, the Plant Wizard, and Some of His Achievements 539.
Varieties of Wheat 3731.
Life on Canada's Great Wheat Farms 605.
Gathering Wheat in Russia 3089.
Asking the "Rag Doll" about the Corn Crop 889.
Oats, the Cereal with the Highest Protein Value 2549.
Varieties of Barley 331.
The Largest Grain Elevator in the World 604.
How Tibetans Grind Their Grain 3496.
The Picture Story of a Grain of Rice 3014.
"Man Power" in an Oriental Rice Field 3013.
Mrs. Igorot in Her Rice Field 2766.
The Terraced Rice Lands in the Philippines 2767.
Hawaiian Rice Field 1604.
Sturdy Pioneers of the Grass Family 1502.
A Factory Town on a Clover Root 810.
An Alfalfa Field in Mississippi 2263.
The Cowpea and Its Food 910.
The Early Life of Jack's Bean Stalk 348.
The Ancestor of the Potato 2900.
A Potato Field in Bloom 2901.
Harvesting Potatoes in Florida 2901.
The Truth About "Cabbages and Kings" 1395.
Members of the Cabbage Family 553, 554.
In Michigan's Famous Celery District 2224.
Drying Cloves in a "Garden of Spices" 3318.
A Page of Spices 3319.
Picking Peppers Near Singapore 2723.
Planting and Harvesting the Sugar Cane Crop in the Hawaiian Islands 3386.
The Most Valuable Sorghum 3276.
The Maple That Provides the Sugar Cakes 2138.
When the Sap Begins to "Run" 2139.
Coffee from Blossom to Drying Floor 821.
A Coffee Plantation in Brazil 822.
Where the Coffee Goes on Shipboard 824.
The Different Kinds of Tea 3446.
On a Japanese Tea Farm 3446.
Honor Students Picking Tea 3450.
Setting Out the Tea Plant 3450.
Raising Tobacco under Cheese Cloth 3508.
Kentucky Hemp 1917.
A Porto Rican Tobacco Field 2887.
It Looks Like Snow, But It's a Tobacco Field 937.
In Cotton-Picking Time 902.
Glimpses of Ireland's Famous Flax Industry 1291.
Harvesting the "Rope" Crop 1631.
A Mexican Hemp Plant 2214.
The Manila Plant and How It is Harvested 3064.
The Glory of the Orchard in Springtime 3535.
Planting a Fruit Tree 1378.
A Young Tree Before and After Pruning 1378.
The Best Way of Wrapping Root Grafts 1379.
Saving a Tree's Life 1379.
Smoking Jack Frost Out of the Orange Groves 1380.
In France's Famous Vineyards 1350.
In a Nova Scotia Apple Orchard 604.
Apricots Drying in the Sun 161.
Peaches, Ripe and Ready to Drop 2699.
Famous Peach Orchard in Michigan 2223.
A Descendant of the Little Wild Grape 1501.
Harvesting Bananas 325.
"Bread" That Grows on Trees 501.
How the Dates Have Been Trained to Come to Dinner 966.
Story of the Wasp That Helps Make Figs 1238.
Giving Olives Their Flavor 2579.
The Gray Olive Groves of the Spanish Hills 3302.
A California Orange Grove 2589.
A Pineapple Packed with Sweetness 2809.
Where the Delicious Pineapples Grow 1604.
Rocky Ford Melons 2195.
The United States Has 200,000 Acres of Watermelons Like These 2196.
A Lucious Cluster of Golden Grapefruit 1500.
Some Florida Grapefruit 1298.
Seven Varieties of Nuts 2545.
Biography of a Hickory Nut 1648.
The Pecan, The Most Valuable Nut of the South 2705.
How Flowers Turn into Peanuts 2701.
Riding the Coconuts to Mill 818.
Walking Right Up a Tree in Coconut Land 819.
Wonders of Scientific Live Stock Breeding 49.
The Horse and His Geologic Ancestors 1682.
Different Types of Horses 1684, 1685.
Some Fine Horses of Old Kentucky 1916.
What Life is Like on a Big Nebraska Stock Farm 2430.
On an Illinois Stock Farm 1732.
A Fine Herd of Quebec Cattle 2947.
A Herd of Holstein Cattle 2263.
A Cattle Herd of South Dakota 3297.
Three Members of the Hog Aristocracy 1670.
What Alfalfa Does for Hogs 89.
The Sheep's Ancestors were Nimble Wild Creatures 3199.
Abyssinian Maned Sheep 3198.
The Pyrenees Shepherd and His Sheep 453.
French Shepherds on Stilts 1347.
Idaho Wool "on the Hoof" 1729.
The Shepherd's Intelligent Helper 1019.
The Drover's Shaggy Friend 1019.
A Swiss Boy and His Goat 1476.
Tending Goats in Sweden 3403.
What Proper Care Will Do in Egg Production 2908.
Important Breeds of Poultry 2909.
An Ideal Arrangement for Laying Hens 2910.
How to Pick a Good Hen 2910.
An Incubator and the Results It Obtains 2911.
A Whole Quacking Acre in New Jersey 2460.
An African Guinea-Fowl 1548.
Distinguished Members of the Pigeon Family 2805.
The Contented Life That Brings Rich Milk and Cream 950.
Cleanliness Means Health in the Dairy Industry 951.
Learning to Judge Dairy Cows 3653.
How to Pick a Good Dairy Cow 952.
What Good Butter is Made Of 544.
Water Buffalo of the Philippines 2765.
Asiatic Water-Buffalo 527.
The Camel—So Very Queer and Yet So Very Useful! 589, 590.
A Camel Caravan 3106.
The Llama 2039.
Reindeer, The Eskimo's "Life Insurance" 2993.
The Tibetan's Friend—The Yak 3827.
The Ostrich—The Express Train of the Desert 2603.
The Humped Cattle of India 1749.
"Roman" Oxen of Italy 1838.
When the Locusts Cover the Land 1504.
The Evil Genius of the Cotton Fields 904.
This is the Apple "Worm" 820.
The Development of the Plow 2839.
They've Plowed this Way in Persia for 2000 Years 2734.
Cutting Crops with Scythes in Poland 2856.
The Relative Value of Uncle Sam's Chief Farm Products 3591.
Fields, Orchards, and Dairy Farms in New York 2484.
Farm Life in Alberta 83.
A "Perfume" Farm in Sunny France 2728.
Farming in a Swiss Valley 3416.
Harvest in a Valley of the Tyrol 3574.
Preparing Fodder in Southern Russia 3085.
A Valley in Arabia and Its Terraced Fields 166.
Farming in Modern Egypt 46.
Farming in Australia 263, 264.

# Books for the Student of Agriculture

The Call of the Land. Elisha B. Andrews.
The Lure of the Land—Farming after 50. Harvey W. Wiley.
Three Acres and Liberty. Bolton Hall.
Where Opportunity Knocks Twice. Forrest Crissey.
Opportunities in Farming. Edward O. Dean.
Hints to Homeseekers. Warren J. Geib.
Farmers for Forty Centuries—Agriculture in China, Korea and Japan. Franklin H. King.
English Farming, Past and Present. Rowland E. Prothers.
The Story of Agriculture in the United States. Albert H. Sanford.
Agricultural Economics. Henry C. Taylor.
Deep Furrows. Herbert J. Moorhouse.
Rural Organization. Walter Burr.
The Story of the Nonpartisan League Charles E. Russell.
Wheat and Woman. Georgina Binnie Clark.
The Desert and the Rose. Edith Nicholl Ellison.
Productive Agriculture. John H. Gehrs.
Agriculture and the Farming Business. Oscar H. Benson.
Intensive Farming. Lee C. Corbett.
American Irrigation Farming. Walter H. Olin.

*consult the Easy Reference Fact-Index at the end of this work*

**Use of Water in Irrigation.** Samuel Fortier.
**Dry Farming.** William Macdonald.
**Dry Farming.** John A. Widtsoe.
**The Farmer of Tomorrow.** Frederick I. Anderson.
**The Farmer and the New Day.** Kenyon L. Butterfield.
**The Farmer's Business Handbook.** Isaac P. Roberts.
**Law for the American Farmer.** John B. Green.
**Farm Accounting.** Hiram G. Scovill.
**Agricultural Commerce.** Grover G. Huebner.
**Efficient Marketing for Agriculture.** Theodore Macklin.
**Agricultural Prices.** Henry A. Wallace.
**Farm Management.** Jacob H. Arnold.
**Equipment for the Farm and the Farmstead.** Harry C. Ramsower.
**Handy Farm Devices and How to Make Them.** Rolfe Cobleigh.
**Farm Mechanics.** Herbert A. Shearer.
**The Farmer His Own Builder.** Howard A. Roberts.
**The Modern Gas Tractor.** Victor W. Page.
**Field Management and Crop Rotation.** Edward Cary Parker.
**Soil Conditions and Plant Growth.** Edward J. Russell.
**Principles and Practice of Agricultural Analysis.** Harvey W. Wiley.
**Principles of Agricultural Chemistry.** George S. Fraps.
**The Chemistry of Plant and Animal Life.** Harry Snyder.
**The Chemistry of the Farm.** Robert Warrington.
**Soils and Plant Life.** Jules C. Cunningham and W. H. Lancelot.
**The Soils and Agriculture of the Southern States.** Hugh H. Bennett.
**Fertilizers and Crops.** Lucius L. Van Slyke.
**How Crops Feed.** Samuel W. Johnson.
**How Crops Grow.** Samuel W. Johnson.
**The Food of Plants.** Arthur P. Laurie.
**Fertilizers.** Edward B. Voorhees.
**Manures and Fertilizers.** Homer J. Wheeler.
**Manual of Weeds.** Ada E. Georgia.
**Manual of Vegetable Garden Insects.** Cyrus R. Crosby.
**The Principles of Vegetable Gardening.** Liberty H. Bailey.
**Vegetable Gardening.** Ralph L. Watts.
**Vegetable Forcing.** Ralph L. Watts.
**Market Gardening.** Frederick L. Yeaw.
**Practical Gardening. Vegetables and Fruits.** Hugh Findlay.
**The Sugar Beet in America.** Franklin S. Harris.
**The Potato.** Arthur W. Gilbert.
**The Sweet Potato.** T. E. Hand and K. L. Cockerham.
**Bush Fruits.** Fred W. Card.
**Manual of Fruit Insects.** Mark V. Slingerland and Cyrus R. Crosby.
**Fruit Growing in the Arid Regions.** Wendell Paddock.
**Citrus Fruits.** John Eliot Coit.
**The Commercial Apple Industry of North America.** John C. Folger.
**Strawberry Growing.** Stevenson W. Fletcher.
**Peach Growing.** Harris P. Gould.
**The Principles of Fruit Growing.** Liberty H. Bailey.
**Manual of Tree Diseases.** W. Howard Rankin.
**Manual of Fruit Diseases.** L. R. Hesler.
**Manual of Tropical and Sub-Tropical Fruits.** Wilson Popenoe.
**Manual of American Grape Growing.** Ulysses P. Hedrick.
**The Pruning Manual.** Liberty H. Bailey.
**The Farm Wood Lot.** Edward G. Cheyncy.
**Bee Keeping.** Everett F. Phillips.
**The Hen at Work.** Ernest Cobb.
**Commercial Egg Farming from Practical Experience.** George S. Hanson.
**Chicken Money—How to Make Farm Flocks Profitable.** Homer W. Jackson.
**Success with Hens.** Robert Joos.
**Making Money from Hens.** Harry R. Lewis.
**The Mating and Breeding of Poultry.** H. M. Lamon and R. Slocum.
**Practical Poultry Production.** Joseph W. Kinghorn.
**Prairie Farmers' Poultry Book.** William Osburn.
**Poultry.** Alton W. Richardson.
**Fundamentals in Poultry Breeding.** John H. Robinson.
**Turkeys, Ducks, and Geese.** Harold A. Nourse.
**Milk and Its Products.** Henry H. Wing.
**The Book of Butter.** Edward S. Guthrie.
**Dairy Farming.** Dallas S. Burch.
**Productive Dairying.** Robert W. Washburn.
**Dairy Cattle and Milk Production.** Clarence H. Eckles.
**Manual of Milk Products.** William A. Stocking.
**The Story of Milk.** Johan D. Frederikson.
**Farm Dairying.** Christian Larsen.
**Farmers' Clean Milk Book.** Charles E. North.
**Dairy Chemistry.** Harry Snyder.
**Manual of Farm Animals.** Merritt W. Harper.
**The Principles and Practice of Judging Live Stock.** Carl W. Gay.
**The Fundamentals of Live Stock Judging and Selection.** Robert S. Curtis.
**Profitable Stock Raising.** Clarence A. Stramel.
**Profitable Stock Feeding.** Howard R. Smith.
**The World's Meat Future.** Albert W. Pearse.
**Breeding of Farm Animals.** Merritt W. Harper.
**Western Live Stock Management.** Ermine L. Potter.
**The Horse.** Isaac P. Roberts.
**The Training and Breaking of Horses.** Merritt W. Harper.
**Sheep Feeding and Farm Management.** Duane Howard Doane.
**Sheep Farming in North America.** John A. Craig.
**Pork Production.** William A. Smith.
**Success with Hogs.** Charles Dawson.
**Forty Years' Experience of a Practical Hog Man.** Andrew J. Lovejoy.

Note: The book lists following the Outlines on Home Economics and Nature Study contain books for younger readers on gardening and other "first steps" in Agriculture.

# Interest-Questions in Agriculture

How can you tell a squash from a pumpkin? 3333.
What gives the grapefruit its name? 1499.
Is the potato a root? 2901.
What is trepang? 3165.
Why do cows and their relatives swallow their food first and chew it afterwards? 3082.
In what season of the year do lemons ripen? 1986.
Erasers, salad oil, dynamite, "red rubber" sponges, postage stamps, battleships, cattle feed, syrup, tobacco pipes, stiff collars—what common cereal do these make you think of? 890.
Why would the earth become sterile without the earthworm? 1066.
How long does a hen's egg take to hatch? A duck's egg? 408.
How large a load can a camel carry and how far can it travel in a day? 591.
What orchard tree does not come into full bearing until it is 30 years old? 2579.
What bird lays a 3-pound egg? 2603.
How does the palm tree get its name? 2647.
What familiar nuts grow underground? 2700.
Why are bobolinks welcomed by farmers in the North and dreaded by farmers in the South? 446.
What American tree is closely related to the breadfruit tree? 501.
Why does the horse have only one toe on each foot? Where were there once four-toed horses? 1683.
How did one coffee tree supply the world? 822.
Why must coffee be grown 1,200 to 2,000 feet above sea level? 822.
Why are armies of ants welcome on a coffee plantation? 822.
To what is the flavor of a spice due? 3318.
How does man get a milk cow and a beef from the same stock? 662.
What does it mean to belong to the cabbage family? 553.
How does the fruit grower keep Jack Frost out of his garden? 1380.
How has man changed the shape and character of sheep? 3199.
What plant is harvested from July to November? 902.
What does a farmer mean by "heavy" soil? 3273.
How were the grape vines of France threatened and saved by American vines? 1501.
Why has the market supply of blueberries always been from wild bushes? 439.
How is soil enriched by certain plants? 2511.
Do the sweet potato and the Irish potato belong to the same family? 3405.
Why are the tea plants kept pruned? 3445.
Why did our great-grandmothers hold up their hands in horror at the idea of eating a tomato? 3512.
What fruit of North America is picked green and packed away to ripen? 2701.
What accounts for the small size of the Shetland pony? 1685.
How do bees carry the pollen they collect? 360.
How do the feathers of a pigeon differ from those of an owl? 1228 (picture).
What fruit cannot be grown without the aid of an insect? 1237.
What familiar fruit comes from the same genus of trees as the India-rubber tree? 1237.
What familiar orchard fruits are closely related to the rose? 3066.
Why do cows pull grass instead of cutting it off with their teeth? 663.
What common article of food comes from the pith of palms? 3104.
What common fiber plant grows its male and female flowers on separate plants? 1630.
What insect sometimes costs the farmers of the Mississippi Valley $60,000,000 in a single year? 752.
Are all hawks enemies of the farmer? 1605.
How is it possible to develop new varieties of fruits and vegetables? 538.
Why can cattle eat rough feed that horses cannot? 663.



# INDUSTRIES *and* APPLIED SCIENCES



INDUSTRIES and Applied Science form the very backbone of modern civilization. A complete study of their field would encompass the whole fabric of our practical daily lives and would branch out into such subjects as Geography, Botany, Zoölogy, the Physical Sciences, the Social Sciences, and many other departments of knowledge. This Outline is intended merely as a general survey of the chief materials of industry and of the principal ways in which they are obtained and used, together with a summary of the important sources of power and methods of transportation and communication. The list of pictures dealing with industries and inventions which is attached to this Outline will be found of unusual importance and value to those seeking clear and concise information on the subjects in question.

I. **RAW MATERIALS AND HOW THEY ARE OBTAINED:**

A. **Minerals:**

a. **Mining: 2248, 2247.**

1. Coal 811; Petroleum 2749; Natural Gas 1407.
2. Common Metals: 2201; Iron 1817; Copper 881; Lead 1973; Tin 3504; Zinc 3839; Aluminum 104; Antimony 150; Arsenic 220; Bismuth 428; Cobalt 816; Manganese 2135; Mercury 2199; Nickel 2506; Tungsten 3548.
3. Precious Metals: Gold 1479; Silver 3240; Platinum 2831; Radium 2959.
4. Gems: 1409. Diamonds 1001.
5. Other Common Minerals: Borax 464; Salt 3115; Sulphur 3389; Graphite 1502; Potash 2898; Asphalt 234.

b. **Quarrying: 2943.**

1. Building Stones: Granite 1497; Marble 2144; Slate 3248; Limestone 2010; Sandstone 3123.
2. Other Minerals: Clay 783; Sand 3123; Gypsum 1554; Talc 3430; Chalk 685; Asbestos 225; Mica 2219; Emery 1142.

B. **Plant Materials:**

a. **Food Crops and Fibers:**

1. Grains 3730; Fruits 1377; Vegetables 1397; Plants Grown for Sap 3385, 365, 2138; Spices 3317; Nuts 2545; Sago 3104.
2. Cotton 901; Flax 1291; Hemp 1630; Jute 1905; Sisal 3244.

**Note:** A more detailed survey of Food and Fiber plants will be found in the Outline on Agriculture.

b. **Timber: 2076, 1327, 3530.**

1. Woods: Alder 85, Ash 225; Beech 364; Birch 399; Buckeye 523; Butternut 548; Cedar 670; Cherry 716; Chestnut 718; Cypress 946; Ebony 1073; Elm 1138; Eucalyptus 1186; Fir 1248; Hickory 1647; Holly 1673; Ironwood 468; Juniper 1903; Larch 1963; Linden 2018; Locust 2045; Mahogany 2124; Mangrove 2135; Maple 2138; Mesquite 2201; Oak 2547; Olive 2580; Paper Mulberry 2366; Pine 2807; Poplar 2880; Quebracho 2677; Rosewood see Fact-Index; Sequoia 3175; Satinwood 1748; Sandalwood 3123; Spruce 3332; Sloe 3251; Sycamore 3424; Tamarind 3432; Tulip Tree 3547; Teak 3451; Walnut 3667; Willow 3742.
2. Forests and Forestry Protection: 1327.

c. **Some Other Plant Materials:** Tobacco 3508; Balsam 1248; Bamboo 323; Camphor 594; Cane 1502; Cellulose 673; Cork 887; Coconuts 818; Dye Woods 1049 (Butternut 548, Hickory 1647, Walnut 3667, Logwood 2046); Gutta-percha 1554; Gums 1552; Resins 2997; Rubber 3071; Tagua Nuts 1854; Waxes 3706; plants used for Perfumes: 2728, 2385, 3123.

C. **Animal Materials:** Domestic animals, which are the greatest source of animal materials, are treated in the Outline on Agriculture.

a. **Hunting, Trapping: 3527.**

1. Furs: 1389; Badger 304; Beaver 356; Bear 349; Chinchilla 752; Ermine 1174; Fox 1336; Hares and Rabbits 1584; Leopard 1988; Lynx 2087; Marten 2155; Mink 2251; Mole 2278; Muskrat 2384; Oppossum 2585; Otter 2605; Raccoon 2951; Seal 3166; Skunk 3246; Squirrel 3333; Tiger 3498, Wolf 3774; (Hudson's Bay Company 1692).
2. Ivory and Bone 1853, 452–3; Elephant 1130; Hippopotamus 1651; Walrus 3668.

3. Perfume: 2728. Musk Deer 2383; Musk Ox 2383; Crocodile 923.
4. Feathers: 1229. Egret 3365; Paradise Birds 2676; Grebe 1515; Eider Duck 1046.

b. **Fishing:**
1. Fish: 1271, 1280. Bass 345; Catfish 662; Cod 820; Eel 1089; Flatfish 1289; Haddock 1558; Halibut 1565; Herring 1645; Lamprey 1958; Mackerel 2102; Muskellunge 1278; Octopus 943; Perch 2726; Pike and Pickerel 1278; Salmon 3113; Sardines 3126; Shad 3188; Shark 3197; Sturgeon 3374; Sunfish 3396; Swordfish 3423; Tarpon 3438; Trout 3545; Tunny 3552; Whitefish 3733.
2. Sea Mammals: Whale 3723; Porpoise 2884; Seal 3166; Walrus 3668.
3. Water-Dwelling Reptiles: 2997. Turtle 3562; Terrapin 3563.
4. Shellfish: Oyster 2612; Clam 782; Crab 912; Crawfish 915; Lobster 2041; Shrimp 3225.
5. Other Sea Products: 1014. Coral 884; Pearls 2703; Sponges 3328.

c. **Raw Materials Used for Cloth Making:** Silk 3234; Wool 3782; Alpaca 100; Goat's Hair 1476; Camel's Hair 590; Other Hair 1560.

d. **Other Animal Materials:** Honey 362; Cochineal 817, 3133; Ambergris 2728, 3726; "Lac" 1954.

II. POWER AND HOW IT IS APPLIED:

A. **Natural Sources of Power:**

a. **Fuels Used in Generating Power:** Wood 399, 597, 719, 2135; Charcoal 688; Wood Alcohol 84; Coal 811; Coke 824; Peat 2704; Petroleum 2749; Kerosene 2749; Gasoline 1408; Gas: Illuminating Gas 1406, Natural Gas 1407, Acetylene Gas 7.

b. **Water 3694; Air 52 (Wind 3750); Electricity 1108.**

c. **Animal Sources of Power: see Outline on Agriculture.**

B. **How Natural Sources of Power are Put to Work:**

a. **Fuels:** Steam Engine 3348; Gas Engine 1403.

b. **Water:** Water Wheel 3696; Hydraulic Machinery 1708; Water Turbine 3553.

c. **Air:** Windmill 3749; Pneumatic Appliances 2846; Brakes 492.

d. **Electricity:** Dynamos and Batteries 1050.

e. **Animals:** Agricultural Machinery, Carriages, Wagon: 46, 1684.
**Note:** Animals differ from all other agencies of power in that they both produce power and put it directly to work.

III. TRANSPORTATION AND COMMUNICATION: **3524.**

A. **Land Transportation:**

a. **Roads and Streets 3023; Bridges 505; Tunnels and Subways 3550; Railroads 2962.**

b. **Vehicles:** Wagons and Carts 45 (picture), 47 (picture); Sleds 3085 (picture); Bicycles and Motorcycles 391; Automobiles 274; Street Cars, Elevated Trains, Subway Trains 3371; Railway Cars 2965; Locomotive 2043.

B. **Water Transportation:**

a. **Waterways:** Rivers 3022; Canals 625; Lakes 1957; Ocean Routes 255 (map), 2624 (map), 2420.

b. **Craft:** Boats and Canoes 441; Motor Boats 2357; Ships 3207; Submarines 3375.

C. **Air Transportation:** Balloons 310; Airplanes 54.

D. **Communication:** Telephone 3458; Telegraph 3454; Wireless 3758; Cables 556.

IV. MANUFACTURING:

A. **Metal-Working:**

a. **Industries Concerned with the Extraction of Metals:** Metallurgy 2201, 944, 2200; Assaying 236; Smelting and Refining 882, 1820; Use of Furnaces 1382.

b. **Industries Concerned with Shaping and Finishing of Metals:** Forging 1826; Casting 1820; Lathing, Punching, Drilling, Planing, Sawing, Cutting, Pressing, 3514 (Tools); Rolling 1826; Welding 3716; Electroplating 1125.

c. **Metal Products:**
1. Chief Metals and Their Uses: Iron and Steel Products 1825; Aluminum 104; Copper 881; Lead 1973; Tin 3504; Zinc 3839; Nickel 2506; Gold 1482; Silver 3242; Platinum 2831.
2. Machinery: See list of machines under the entry "Machinery" in the Fact-Index.
3. Other Devices Made of Metal: Armor-Plate 216; Bells 377; Buttons 548; Cables 556; Cans 632; Cannon and Firearms 633, 1252; Calculating Machinery 571; Cash Registers 653; Clocks and Watches 797; Electrical Devices 1115; Knives and Forks 1937; Lamps 1958; Locks and Keys 2042; Machine Guns 2097; Meters 2204; Nails 2387; Pens 2709; Pins 2807; Plows 2839; Rails 2964, 1822–23 (pictures); Steamship 3212; Stoves 3368; Traps 3527; Typewriters 3573; Wire 3757.

B. **Building Materials:** Iron and Steel 1815, 529; Lumber 2076; Limestone 2010; Granite 1497; Sandstone 3123; Marble 2144; Slate 3248; Concrete 856; Cement 674; Brick and Tile 502.

C. **Wood Products and Associated Industries:**

a. **Furniture Making 1383; Veneer 3620.**

b. **Other Products:** Airplane Parts 2124, 3333; Baskets and Boxes 399; Bats and Clubs 3743, 3251; Bows 3830; Cask Staves 2548; Charcoal 688; Gun Stocks 548, 3667; Handles 225, 3251, 3743; Paper Pulp 523, 3333, 3743; Pencils 1903, 2712; Ships and Ship Parts 2548, 3332, 3451; Ties and Posts 719, 946, 3176; Trestles and Wharves 512, 2135, 3176.

c. **Associated Industries:** Glue 1475; Lacquer 1954; Paints and Varnishes 2642.

D. Ceramic Industries: Pottery 2903; Porcelain and China 2881; Enameled Wares 1145; Glass 1471.
E. Cloth, Clothing, and Fiber Manufacturing:
  a. Processes in Cloth Making: Spinning 3326; Weaving 3326, 904, 3434, 3239 (picture), 1949; Knitting 1935; Felting 1231; Bleaching 435; Mercerizing 2198; Dyeing 1049, 814, 1777, 2046, 104.
  b. Products:
    1. Cloth: 804. Asbestos 225; Cotton 901; Felt 1231; Linen 2018; Silk 3234; Wool 3782.
    2. Other Products: Thread 3493; Rope and Twine 3063; Lace 1949; Linoleum and Oilcloth 2018; Rugs and Carpets 3077; Tapestry 3433.
  c. Clothes:
    1. Designing (Costume) 897; Sewing 3183; Embroidering 1140.
    2. Garments 805 (using Cloth 804, Furs 1389, Lace 1949, Button 548); Hats and Caps 1597 (Feathers 1229, 2603, 3365, 2676, 1515); Gloves 1474; Knitted Wear 1935.
F. Rubber and Products: **3071.** Hose, Mechanical Articles 3071; Pneumatic Tires 3075; Waterproof Clothing 3076.
G. Leather:
  a. Leather Making: **1975.** Cowhide, Calfskin 1977; Sheepskin 1977; Chamois 686; Goatskin 1477; Pigskin 1671; Shagreen 236; Walrus 3668; Buffalo 527; Alligator 98; Crocodile 923.
  b. Chief Products: Gloves 1475; Shoes 3220; Book Binding 458; Parchment and Vellum 2667.
H. Food Manufactures:
  a. Flour Milling **1301; Baking 496; Breakfast Foods 501; Macaroni 2093.**
  b. Sugar and Sugar Products: Beet 3388, and Cane 3385; Maple Sugar 2141 (pictures); Candy 628.
  c. Chocolate **755; Coffee 820; Tea 3445; Spices, Condiments, Flavorings 3317; Vinegar 3644; Salt 3115.**
  d. Meat Packing **2180; Dairy Products: Butter 543, Cheese 708.**
  e. Other Food Manufactures: Oleomargarine 2577; Baking Powder 305; Yeast 3828; Fats and Oils 1225.
  f. Preserving of Food: Canning 631, 3113, 3126, 1645; Drying or Dehydration 986, 2239, 2928, 2974, 161; Refrigeration or Cold Storage: 825, 2989.
  Note: Although the Cold Storage Industry cannot be called a manufacturing industry, it is of so much importance that it deserves mention here.
I. Paper Making: **2666.**
J. Printing: **2916.**
  a. Printing Processes: Electrotyping 1125; Engraving 1168; Stereotyping 3355; Type Operating 3572; Linotype 2019; Monotype 2303.
  b. Bookmaking **455; Newspapers 2472; Magazines and Periodicals 2475.**
K. Photographic Industry: **2777, 2341.**
L. Toys: **3521; Dolls 1025.**
M. Miscellaneous Manufactures: Drugs 1041; Tobacco 3510; Quinine 2950; Opium 2584; Explosives 1211, Dynamite and Nitroglycerin 1050, Nitrogen 2511; Soap 3263; Perfume 2726; Celluloid 672; Ivory Products 1853; Wax 3706; Cork 887; Tar and Pitch 3436; Wood Alcohol 84; Turpentine 3561; Camphor 594; Musical Instruments 2381.

V. ENGINEERING AND ENGINEERING CONSTRUCTION: **1149, (Surveying 3397).**
A. Building Construction: **528, 176, 2003.**
B. Ship Building: **3214.**
C. Heating **1621;** Lighting **1958, 1123, 1406.**
D. Sanitation: Waterworks 3701; Aqueducts 164; Reservoirs 954; Plumbing 2840; Sewerage 3183.
E. Highway and Waterway Construction: Roads 3023; Railroads 2962; Tunnels and Subways **3550;** Bridges 505; Harbors and Docks 1578; Dikes (see Fact-Index); Jetties 1888; Canals 625.
F. Irrigation and Reclamation: **1827.**
G. Mine Construction: **2250.**

# Pictures of Industries and Inventions

How Coal, Salt, and Gold are Mined 2249.
The Wealth Uncle Sam Digs from the Ground 2251.
Steps in the Mining of Coal 812-5.
How an Oil Well is Drilled 2750.
Gathering the Inexhaustible Harvest of Pitch 235.
Where Iron Ore is Dug with Steam Shovels 1816.
Where Nickel Starts on Its Travels 2506.
Malay Girls "Panning" Tin 3504.
A Gold Mill Forced Underground by Snow 1480.
How the Precious Metal is Dug Out 1481.
Diamond-Mining in the Old Days 1002.
The Modern Way of Getting Diamonds out of the Ground 1003.
Derrick in a Louisiana Sulphur Field 3389.
Gathering Seaweed for Making Potash 2899.
How Potash is Cooked out of the Seaweed 2899.
How Nature Helps the Quarryman 2944.
An Asbestos Mine in Quebec 2946.
Cutting the Marble from Its Ancient Bed 2144.
The Picture-Story of Lumber 2077-81.
How a Steel Trap Catches Its Victims 3528.
How Fish Catch Themselves in the Northland 1283.
Harvesting Salmon in the Northwest 1284.
Ingenious Ways of Gathering the Ocean's Crop 1285.
Weighing the Fish for Market 1286.
Saving Lobster Eggs 2042.
If the Lobster Only Knew 2042.
At the Ends of the Earth with the Whale Catchers 3723-6.
Giant Sponges from the West Coast of Florida 3329.
History of Electricity in Picture 1119.
The Secret of the Electric Current 1109.
How Man Has Put Electricity to Work 1115.
The Lights You Just "Turn On" 1123.
The Power behind the Electric Light 1124.
Harnessing the Power of Niagara 3695.
How the Steam Engine Works 3350-2.
Looking Inside a Gas Engine 1405.
How Hydraulic Machinery Works 1709.
How the Steam "Windmill" or Turbine Works 3553.
A Closer View of the Vanes of a Turbine 3554.
How a Blast of Air Stops a Train 492.

How the Electric Dynamo Works 1051-2.
How a Pneumatic Tube System Works 2846.
A Drill Operated by Air 2847.
This Hammer Delivers over 1500 Blows a Minute 2847.
The Picture-Story of Transportation 3525.
Section of the Famous "Tubes" under the Hudson River 3550.
Two Famous Examples of the Bridge-Builders' Skill 507.
The First American Locomotive 2963.
A Wood Burner of the 60's 2963.
A Giant Locomotive of Today 2043.
Where Trains Travel Across a Spider-Web of Steel 2966.
Hauling Freight with Electric Power 2968.
Rivals of the Road—Steam and Electricity 2969.
Sleds in the Snow-Bound North 3085.
The Grandfather of American Automobiles 274.
The First Self-Propelled Vehicle 275.
How an Automobile Works 278-87.
Some Primitive Types of Water Craft 443.
How the Ship Which Discovered America Compares with a Modern Liner 3207.
An Early Leviathan 3208.
Some Famous Styles in Sailing Vessels 3209.
How the Ocean Giant is Pushed and Guided 3213.
The Great Moment that Tests the Ship 3215.
Land and Sea Giants 3216.
A Street on a Floating City 3217.
Why They are Called "Floating Palaces" 3219.
What a Submarine Looks Like 3375.
The Periscope the "Eye" of the Submarine 3377.
The First Balloon Ascensions in the History of the World 313.
A Sounding Balloon Rising Alone 314.
Evolution of the Balloon 315.
A Balloonist and His Sand Bags 316.
Observation Balloons in the World War 317.
How the Flying Machine Flies 56.
Flying Machine History in Pictures 57.
Some Interesting Mechanical Birds 62.
The First Machine to Fly across the Atlantic 63.
How the Airplane Works 64-8.
How the Voice is Carried over the Telephone 3459.
How the "Automatic" Telephone Works 3460.
Where Your Calls for Other Exchanges are Handled 3461.
The Father of Switchboards 3461.
"Telegraphing" through the Ages 3455.
Cabling Across the Sea 3456.
The Story of the "Dots" and "Dashes" of the Telegraph 3457.
The Cables that Bind the World Together 556.
The First Cable and Its Many Troubles 557.
The Machinery that Helps Lay the Cable 557.
Nearer View of a Damaged Cable 558.
Fishing up an Injured Cable 558.
Where the Cable Comes to Land 560.
How the Wireless Works 3759-61.
New Services that Radio Performs at Sea 3762.
The Wireless Telephone Helps Fight Forest Fires 3765.
How the Great Copper Smelters Turn Crude Ore into Metal 882-3.
How Gold is Prepared for Use 1482.
From Ore to Iron and Steel 1817-21.
Making the Ingot into Rails 1822-3.
Uses of Iron, the "Foundation of Civilization" 1825.
Making the Huge Tools of Industry 3514-6.
The Art of the Silversmith 3241.
The Most Critical Moment in Bell Making 378.
Various Types of Cannon and Firearms 633, 1253.
The Machine Gun and Its Mechanism 2098-2101.
How Scales Figure Out Prices 571.
The Clever Machine and the Beef Roast 572.
The Cash Register, the Machine with a Memory 653.
The Water Clock of Canton 798.
Strange Ways of Measuring Time 799.
A Clock that Understands Astronomy 797.
Another Knowing Old Clock 800.
How Clocks Count Their Ticks 801.
The Largest Clock in the World 800.
Making a Pet of the Watch 802.
The Tinest Watch and Its Many Tiny Parts 803.
How Man Has Put Electricity to Work 1115.
The Operation of a Tumbler Lock 2042.
How a Cylinder Lock Works 2043.
The "Insides" of a Gas Meter 2205.
The Development of the Plow 2839.
How a Modern Steel Pen is Made 2711.
How Pencils are Made 2713-4.
Early History of a Cement Sidewalk 675.
How Egyptians Made Bricks 503.
How Bricks are Made Today 504.
Steps in Furniture Making 1386-8.
Molding Beauty out of Clay 2903-7.
Weaving Baskets by Machinery 342.
Scenes in the Story of Glass-Making 1473.
Turning Cotton into Cloth 903.
The Picture Story of Wool 3782-6.
Silk from the Silk Worm to the Cloth 3234-9.
From Fiber to Twine 3064-5.
How Lace is Made 1951-3.
Oriental Rug Making 3077-9.
How the Sewing Machine Works 3187.
Processes in the Clothing Industry 806-7.
Eleven Steps in the Making of Men's Hats 1599.
Rubber from Tree to Tire 3071-5.
How the Hides Become Leather 1976-9.
The Early Steps of a Shoe 3223.
An Old Granite Flour Mill 300 Years Old 1302.
Some Phases of Flour Making 1302-3.
Story of the Baker's Loaf of Bread 496-9.
Where the Soda Biscuit Gets Its Start 499.
Soda Biscuits Ready for the Oven 500.
From Sugar Beet to Sugar Bowl 3387.
From Sap to Maple Sugar 2139-41.
The Way the Factory Makes Your Candy 628-30.
How the Bean Becomes Chocolate 755-6.
Roasting, Weighing, and Packing Coffee 823.
How the Japanese Make Tea 3446-50.
Drying Cloves in a "Garden of Spices" 3318.
Harvesting Salt on the Shores of Great Salt Lake 3116.
How the "Salt of the Earth" Reaches Your Table 3117.
Meat Packing from the Stockyards to the Butcher Shop 2182-5.
Nine Chapters in the Life of a Cheese 708.
A Tight Squeeze Makes Good Cheese 709.
Making Oleomargarine 2577-8.
Getting Beans Ready to Can 632.
Prunes Starting to the Grocery 2928.
The Interior of a Modern Refrigerating Plant 2989.
Where "North Pole" Atmosphere Preserves Food 2991.
From Tree Trunks to Sheet Paper 2669-71.
Going to Press in the Old Days and in the New 2917.
How the Monotype and Linotype Work 2303, 2020-23.
The First English Printer and His Shop 457.
Eleven Steps in the Making of a Book 459-63.
Steps in Making an Illustration for This Book 1169-71.
The Newspaper from Reporter to Reader 2473.
The Adventures of the Camera 2778.
Putting a View on Paper—The History of a Photograph 2779.
The Longest Photograph in the World 2783.
Details, Big and Little, in the Making of a Movie 2344-56.
Making the Hobby Horse 3523.
How Sister's Doll Gets Its Head 1026.
Sun-Curing Tobacco in Sunny California 3509.
Tobacco in the Drying Shed 3510.
Making Perfumes from Flowers 2727.
How Soap is Made 3264-6.
Pan's Pipes and Their Children 2382.
One of the Largest Organs in the World 2598.
How the Organ "Breathes" and "Sings" 2599.
Our Piano's Forefather 2797.
The Piano Played by Fingers of Air 2798.
How the Piano Gets Its Voice 2799-2800.
Where the Phonograph Gets Its Voice 2775.
A Queer Way of Surveying 3397.
A Skyscraper on the Way Up 529.
The Use of "Liquid Stone" 530.
Pouring a Whole Building into Molds 531.
Cutting Steel Beams with a Breath of Flame 8.
The Birth of a Modern Lighthouse and Its Structure 2005.
Building a Ship—the Skeleton 3211.
Riveting the Steel Skin of the Ship 3212.
How Theaters Get Pure Warm Air 1623.
How Those Magnificent Highways are Made 3026.
The Railroad Surveyor, Blazing a Trail for Civilization 2965.
A Construction Train Laying Its Own Track As It Goes 2967.
Where Engineers Have Conquered the Alps 3420.
A Prodigy of Engineering 3551.
At Work on the Tubes Under the Hudson 3551.
Many Kinds of Modern Bridges 508-9.
Dredges, the Modern Diggers at Work 1039-41.
How Boats Float Up Stairs 625.
Looking into a Lock from a Canal Boat 626.
The Gigantic Task of Making the Panama Canal 2653-59.
How the Great Locks Work Which Lift the Ships from Ocean to Ocean 2660-1.
Eight Ways of Getting Water 3696.
How a Modern City Gets Its Water 3701-3.

A Roman Aqueduct Still Carrying Water 163.
A Water Tunnel through the Catskills 164.
One of Its Steel-Pipe Siphons 164.
The Egyptian's Method of Irrigation 1827.
A Typical Irrigation Plant of the West 1829.
Inventions that Have Changed the World 1795-1802.
How Barometers Measure Mountain Heights 332.
An Early Chinese Compass 853.
Two Primitive Compasses 854.
The Latest Style of Magnetic Compass 854.
The "Miner's Friend" 968.
Making the Badge of a Hero 978.
A Diamond Cutter at Work 1004.
The Armored Knight of Today, the Diver 1014.
A Little Instrument which Records Earthquakes 1066.
Devices Edison Helped to Perfect 1085.
The Machine that Makes Skyscrapers Possible, the Elevator 1133.
In a Ruby Manufacturing Plant 1410.
The Car that Runs on One Rail 1555.
Some of the Queer Antics of the Gyroscope 1556.
The Clever Machines that Know how to Knit 1936.
How the Speed of Ships at Sea is Measured 2046.
What a Powerful Magnet Does 2122.
The Parachute, the Goddess, and the "Guardian Angel" 2675.
How Stereopticon Pictures are Thrown on the Screen 3354.
How the Astronomical Telescope Works 3463.
How the Transformer Works 3523.
How a Vacuum Bottle Keeps Things Hot and Cold 3614.
A Press Which Prints Wall Paper 3666-7.
How the Mysterious X-Rays are Created 3825.

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Coal and the Coal Mines. Homer Greene.
A Year in a Coal Mine. Joseph Husband.
All about the Treasures of the Earth. Frederick A. Talbot.
The Boy Mineral Collectors. Jay G. Kelley.
Story of a Piece of Coal. Edward A. Martin.
Industry and Trade. Albert G. Keller and A. L. Bishop.
Three Industrial Nations. Lydia R. Blaich.
Geography of Commerce and Industry. William F. Rocheleau.
Industrial and Commercial Geography of the United States. Levi C. Rusmisel.
Story of Cotton. Eugene C. Brooks.
Story of Foods. Forrest Crissey.
Story of Agriculture. Albert Hart Sanford.
Story of Textiles. Perry Walton.
A Day in an Iron Works. Arthur O. Cooke.
A Day with Leather Workers. Arthur O. Cooke.
A Visit to a Coal Mine. Arthur O. Cooke.
A Visit to a Cotton Mill. Arthur O. Cooke.
A Visit to a Woolen Mill. Arthur O. Cooke.
Story of Iron and Steel. Joseph R. Smith.

## HIGH SCHOOL AND AFTER

Ore Mining Methods. Walter Richard Crane.
The Business of Mining; a Brief Non-Technical Exposition of the Principles Involved in the Profitable Operation of Mines. Arthur Joseph Hoskins.
A Year in a Coal Mine. Joseph Husband.
Coal, Its Origin, Method of Working, and Preparation for Market. Francis H. Wilson.
Petroleum. Albert Lidgett.
Petroleum, Its History, Occurrence, Production, Uses, and Tests. George T. Walker.
Prospecting for Oil and Gas. Louis S. Panyity.
The Electric Furnace As Applied to Metallurgy. Arthur D. Little.
The Principles, Operation, and Products of the Blast Furnace. Joseph E. Johnson.
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Copper, from Ore to the Metal. Hugh K. Picard.
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Encyclopedia of the Hunter's and Trapper's Art. F. H. Buzzacott.
Fishing Industry Accounts. Charles Williamson.
Commercial Products of the Sea. P. S. Simmonds.
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Shell-Fish Industries. J. L. Kellogg.
America's Power Resources. Chester G. Gilbert.
Power and Power Transmission. E. W. Kerr.
Development and Transmission of Power. W. C. Unwin.
Steam Power. Clarence F. Hirshfield and T. C. Ulbricht.
Elements of Electricity. Robert A. Millikan and E. S. Bishop.
Home Study Course in Practical Electricity. William H. Radcliffe.
Modern Railway and Steamship Lines. William J. Jackman.
The Paths of Inland Commerce. Archer B. Hulbert.
Railroad and Street Transportation. Ralph Fleming.
The Telephone and Telephone Exchanges. J. E. Kingsbury.
Wireless Telegraphy. J. Zenneck.
Opportunities in Engineering. Charles M. Horton.
Engineering as a Career. F. H. Newell and C. E. Drayer.
Practical Surveying for Surveyors' Assistants, Vocational, and High Schools. Ernest McCullough.
Mechanics, Indoors and Out. Frederick T. Hodgson.
Applied Mechanics. Alfred P. Poorman.
Building Materials. George A. T. Middleton.
Materials of Construction. A. P. Mills.
Iron and Steel. H. P. Tiemann.
What You Should Know When Building a Little House. Charles E. White.
Building Construction. C. F. Dancaster.

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**Ventilation, Heating, and Lighting of Dwellings.** J. W. Thomas.
**Heating and Ventilation of Buildings.** Rolla C. Carpenter.
**Artificial Light; Its Influence upon Civilization.** Matthew Luckiesh.
**The Art of Roadmaking.** Harwood Frost.
**Bridge Engineering.** J. A. L. Waddell.
**Tunneling.** Charles Prelini.
**Railroad Construction.** C. L. Crandall and Fred A. Barnes.
**River and Canal Engineering.** E. S. Bellasis.
**Artificial Waterways and Commercial Development.** A. B. Hepburn.
**Water Supply.** W. P. Mason.
**Sewerage Disposal.** L. P. Kinnicutt, C. E. A. Winslow, and R. W. Pratt.
**Principles of Irrigation Engineering.** F. H. Newell and Daniel W. Murphy.
**Irrigation and Drainage.** F. H. King.
**Furniture Making.** R. S. Bowers.
**Materials of the Painters Craft.** A. P. Laurie.
**Painters' Colors, Oils, and Varnishes.** G. H. Hurst.
**Clay and Pottery Industries.** J. W. Mellor.
**Glass and Glass Manufacture.** Percival Marson.
**A Short Account of Explosives.** Arthur Marshall.
**The Chemistry of Dyestuffs.** M. Fort and L. L. Lloyd.
**The Chemistry of Commerce.** Robert Kennedy Duncan.
**Opportunities in Chemistry.** Ellwood Hendrick.
**Outlines of Industrial Chemistry.** Frank Hall Thorp.
**A Book on Vegetable Dyes.** Ethel M. Mairet.
**Yarn and Cloth Making.** Mary L. Kissel.
**Textiles.** Paul H. Mystrom.
**Cotton.** George Bigwood.
**Wool.** Frank Ormerod.
**All About Dress.** John Bray.
**Scientific Hat Finishing and Renovating.** Henry L. Ermatinger.
**Rubber—Its Sources, Cultivation, and Preparation.** H. Brown.
**Rubber and Rubber Planting.** R. H. Locke.
**Leather, from the Raw Material to the Finished Product.** K. J. Adcock.
**The Manufacture of Boots and Shoes.** Frank Y. Golding.
**Bookbinding and the Care of Books.** Douglas Cockerell.
**Paper, Its History, Sources and Manufacture.** H. A. Maddox.
**Practical Paper Making.** George Clapperton.
**Modern Printing.** John Southworth.
**The Printed Book.** Harry G. Aldis.
**Making a Newspaper.** J. L. Given.
**The American Newspaper.** J. E. Rogers.
**Commercial Photography.** George W. Hance.
**The Science and Practice of Photography.** John R. Roebuck.
**Picture Play Photography.** H. M. Lomas.
**Motion Picture Operation.** H. C. Horstmann and V. H. Tousley.
**How Motion Pictures are Made.** Homer Croy.
**Toys and Toy Making.** George F. Johnson.
**Tobacco from the Grower to the Smoker.** A. E. Tanner.
**The Story of Drugs.** Henry Corbin Fuller.
**Food Industries.** T. Hermann Vulté and Sadie B. Vanderbilt.
**Wheat and Its Products.** Andrew Millar.
**Modern Practical Baking.** William H. Brooks.
**Story of Sugar.** G. T. Surface.
**Coffee: Its History.** J. M. Walsh.
**Coffee; Its Culture and Commerce in All Countries.** Charles G. W. Lock.
**Tea: Its History and Mystery.** J. M. Walsh.
**Tea Blending as a Fine Art.** J. M. Walsh.
**The Modern Packing House.** F. W. Wilder.
**Spices: Their Botanical Origin, Their Chemical Composition, Their Commercial Use.** Joseph K. Jank.
**The Canning of Fruits and Vegetables.** Justo P. Zavalla.
**Practical Refrigeration.** Madison Cooper.

# Books That Tell How to Do Things

**Toy-Making in School and Home.** R. K. Polkinghorne and M. I. R. Polkinghorne.
**Tin Can Toys and How to Make Them.** William Carrie.
**The Home Handy Book.** A. Frederick Collins.
**Things Boys Like to Make.** Edwin W. Foster and John F. Woodhull.
**Practical Things with Simple Tools.** Milton Goldsmith.
**Inventing for Boys.** A. Frederick Collins.
**Mechanics of the Household.** Edward S. Keene.
**How to Make Things.** Archibald Williams.
**Carpentry and Mechanics for Boys.** A. Neely Hall.
**Carpentry for Beginners; Things to Make.** John D. Adams.
**Amateur Joinery in the Home.** George Ashdown Audsley and Berthold Audsley.
**Carpentry and Woodwork.** Edwin W. Foster.
**Woodwork for Beginners.** Ira Samuel Griffith.
**Bird Houses Boys Can Build.** Albert F. Siepert.
**The Amateur Mechanic.** A. Frederick Collins.
**The Boy Mechanic; How to Construct Things which Delight Every Boy.** Popular Mechanics.
**The Boy's Book of Mechanical Models.** William B. Stout.
**Tool and Die Design for Beginners.** Frank E. Shailor.
**Essentials of Drafting.** Carl L. Svenson.
**Shop Practice for Home Mechanics.** Raymond F. Yates.
**Elementary Machine Shop Practice.** T. J. Palmateer.
**Elementary Forge Practice.** R. H. Harcourt.
**Forging of Iron and Steel.** Allyn Richards.
**Plain and Ornamental Forging.** Ernest Schwarzkopf.
**Working in Metals.** Charles C. Sleffel.
**The New Tinsmith's Helper and Pattern Book.** Hall V. Williams.
**The Boys' Book of Engine-Building.** A. Frederick Collins.
**The American Boys' Engineering Book.** A. Russell Bond.
**Second Boys' Book of Model Aeroplanes.** Francis A. Collins.
**Practical Concrete for the School and Home.** Walter F. Beyer.
**Handicraft for Handy Girls.** Dorothy Perkins.
**The Little Girl's Knitting and Crochet Book.** Flora Flickmann.
**A Handbook of Elementary Sewing.** Etta Proctor Flagg.
**Needlecraft in the School.** Margaret Swanson.
**A Guide to Laundry Work.** Mary D. Chambers.
**Secrets of Dry Cleaning.** Leslie E. Foster.
**The High School Cookery Book.** Grace Bradshaw.
**Candy-Making at Home.** Mary M. Wright.
**The Candy Cook Book.** Alice Bradley.
**Home Canning, Drying, and Preserving.** Louise A. Andrea.
**Successful Canning and Preserving.** Ola Powell.
**How Children Learn to Draw.** Walter Sargent and Elizabeth E. Miller.
**Industrial Arts Design.** William H. Varnum.
**Batiks, and How to Make Them.** Pieter Mijer.
**Hand-Wrought Jewelry.** H. R. Sorensen and S. J. Vaughan.
**An Introduction to the Art of Basket-Making.** Thomas Okey.
**Basket-Making.** D. Collier.
**How Paper Boxes are Made.** Robert F. Salade.
**Bookbinding as a Handwork Subject.** John Halliday.
**The School Printshop.** Katherine M. Stilwell.
**Boys' Playbook of Science.** John H. Pepper.
**The Amateur Chemist.** A. Frederick Collins.
**The Boys' Book of Chemistry.** Charles R. Clarke.
**The Child's Food Garden.** Evrie Kilpatrick.
**Gardening for Little Girls.** Olive Hyde Foster.
**The Boys' Camp Manual.** Charles K. Taylor.
**Shooting for Boys.** A. Frederick Collins.
**How Sails are Made and Handled.** Charles G. Davis.
**The Boys' Book of Canoeing and Sailing.** Warren H. Miller.
**Small Boat Building.** H. W. Patterson.
**Electrical Apparatus Making for Beginners.** Albert V. Ballhatchet.
**American Boy's Book of Electricity.** Charles H. Seaver.
**Electrical Construction.** Walter B. Weber.
**Easy Lessons in Wireless.** A. Frederick Collins.
**How to Become a Wireless Operator.** Charles B. Hayward.
**The Elementary Principles of Wireless Telegraphy.** R. D. Bangay.
**Radio-Telephony for Everyone.** Laurence M. Cockaday.
**The Radio Amateur's Hand Book.** A. Frederick Collins.
**Radio Receiving for Beginners.** Rhey T. Snodgrass and Victor F. Camp.

# THE HOW AND WHY OF THINGS

## Interest-Questions on Many Subjects

Why do men's coat collars have a nick in them? 898.
What is the peculiar property of type metal that distinguishes it from most other substances? 99.
Why are coins not made of pure gold and silver? 99.
What is the difference between grain alcohol and wood alcohol? 84.
How does the white of an egg settle coffee? 83.
Why is the upper wing of a biplane set farther forward than the lower wing? 58.
What instrument is used to determine the height of mountains? 333.
What mineral is woven into cloth? 225.
What supports an airplane in the air? 54.
Why is an automobile tire heavier when it is inflated than when it is deflated? 53.
Why is the sky blue? 52.
Why is coffee roasted? 823.
What sort of fish is usually sold in the United States as "sardines"? 3126.
What are shoe-buttons made from? 550.
How does a barometer help forecast the weather? 333.
What makes a balloon rise? 312.
Who was the first man to go up in a balloon? 310.
Does left-handedness "run in a family"? 1644.
What makes the water spurt up in an artesian well? 221 (picture).
How does chloride of lime bleach cloth? 435.
What makes the white scum you often see on brick buildings? 504
Why are most bricks red? 503.
If all the barrels of flour eaten in the United States in one year were placed end to end, how far would they reach? 496.
How is air used to stop a train? 492.
What causes left-handedness? 491.
Why does an injury to the right side of the brain sometimes paralyze the left side of the body? 491.
Which is usually heavier—the brain of a man or the brain of a woman? 491.
Where does most of the borax used in the United States come from? 464.
Why are the backs of most books rounded? 462.
Why does a bone become brittle if you put it in the fire and flexible if you put it in hydrochloric acid? 452.
Why should persons who have fainted be placed flat on the ground? 438.
Why is the hour divided into 60 minutes? 295.
What part of your weight is blood? 438.
How high does the atmosphere extend? 52.
Which falls faster in a vacuum—a feather or a ball of lead? 52.
What makes a Chinaman yellow? 3246.
Why is winter colder than summer? 1063.
Why do we count by tens? 2542.
Why do many foods not "taste" right when you have a cold? 3252.
Why do you sweat more in summer than in winter? 3246.
Why did the ancient Egyptians put straw in their bricks, though we do not? 503.
Does a compass needle point exactly north? 853.
What is color blindness? 1216.
How does smoke cause fogs? 3254.
Why is coal smoke darker than wood smoke? 3253.
Why are the roofs of tunnels rounded? 174.
Why don't the stones in the middle of an arch fall through? 174.
Where is the longest aqueduct in the world? 164.
Why do smoked or salted meats keep better than fresh meats? 151.
Why were surgical operations so much more dangerous 75 years ago than now? 150.
Where is most of the world's amber obtained? 106.
Why is alum used to stop bleeding? 104.
What are the "dog days"? 872.
Why will a leaf appear black if it is held under a red light? 837.
How can you tell whether coffee has been adulterated? 824.
What is the difference between hard and soft coal? 812.
How can you weigh the smoke of a cigar? 715.
What is the commonest metal in the world? 711.
Why is the outer rail of a railroad track raised higher than the inner rail at a curve? 682.
Why is it dangerous to stay in a closed garage with an automobile engine running? 642.
How does a lampwick raise oil to the burner? 641.
What becomes of all the old tin cans? 631.
If you had an income of $1,000,000 a second, how many years would it be before you would have a duodecillion dollars? 571.
Why are buttons put on men's coat sleeves? 548.
Why does an apple fall to the ground? 1506.
What is the difference between a musket and a rifle? 1254.
How could the air be set afire? 1250.
How can you have fire without flame? 1250.
How does a wasp help to make figs? 1237.
How do feathers grow? 1228.
Why, though an inverted image is formed on the retina, don't we see things upside down? 1214.
Why does a drop of alcohol chill one's hand more than a drop of water? 1207.
Where does rain fall from the clouds without reaching the ground? 1207.
Why do "perpetual motion machines" always fail? 1148.
What is emery? 1142.
How did the elephant get its trunk? 1126 (picture).
Why do prices rise and fall? 1077.
What is the difference between wealth and riches? 1077.
How does the earthworm help the farmer? 1066.
How was the earth weighed? 1064.
How old is the earth? 1060.
What part of the ear has nothing to do with hearing? 1057.
Where does eiderdown come from? 1046.
Why does a dog turn around before lying down? 1018.
Why does a dog howl at night? 1018.
Why must a deep sea diver come up slowly? 1014.
What is the difference between an ambassador and a minister? 1012.
How are diamonds made of sugar? 1002.
Why does dew not form on cloudy nights? 1000.
Why was $100,000 saved by setting the clocks ahead? 969.
How can a wire screen prevent explosions? 969.
Why are many great dams horseshoe-shaped? 954.
How much cream does it take to make a pound of butter? 952.
How does a cream separator work? 950.
How are railroad ties kept from rotting? 918.
How did the cranberry get its name? 915.
How are shoe soles made from corn? 890.
Why does cork float? 888.
What was the first metal worked by man? 881.
What element is a black useful drudge and a brilliant jewel? 642.
What white metal more precious than gold was once so cheap that it was used for "gold bricks"? 2831.
Why is aluminum kitchen-ware only twenty years old? 104.
Why is a silver teaspoon tarnished by egg? 3389.
What substance is mined by means of boiling water? 3389.
What metal is used to protect iron from rust? 3839.
What metal is a liquid at ordinary temperatures? 2199.
What metal burns with an intense white light? 2121.
What metal was named for a mischievous goblin? 816.
Why does phosphorus shine in the dark? 2776.
What metal is 67 thousand times more valuable than gold? 2959.
How does an element help to telegraph a picture? 3174.
How can a physician see what is going on in your stomach and intestines? 428.
What gas was discovered on the sun before it was on the earth? 1629.
Why does a hat have a little bow on the inside? 1598.
How are felt hats made of fur? 1597.
Why does a stick look bent in water? 2000.
Why should one not "toe out" in walking? 1324.
What is the largest library in the world? 1992.
What plant rivals the elephant for ivory? 1854.
In what legislative assembly do the members wear hats? 1598.
How did "pig" iron get its name? 1820.
Why are some hailstones larger than others? 1559.
How can fish be made to catch themselves? 1283 (picture).
Is it right to call all insects "bugs"? 1787.
What kind of compass is independent of the earth's magnetism? 1555.
How can water run up hill? 1708.
What fish can climb trees? 1277.
What gives fireworks their colors? 1264.
Where were flounced skirts in style 3,000 years ago? 29.
What people used baskets for carrying water? 342.
How does a tight-rope walker keep from falling? 1509.
Why does a piece of iron get hot when it is hammered? 1618.
Why is fire hot? 1619.
How can ice be used to start a fire? 1620 (picture).
How does grass protect trees? 1503.
What is "mineral wool"? 1472.
What mineral can be made as thin as tissue paper? 2219.
Why must safety matches be struck on the box? 2170.
What are "paste" gems? 1410.
Why, if mercury is a liquid, will it not wet paper? 2199.
How was cooking done in a basket? 342.
How are fruit pits used in gas masks? 1408.

*consult the Easy Reference Fact-Index at the end of this work*

What wood is dug out of the ground? 2201.
What machine has a jacket to keep it cool? 1405.
Why is salt mixed with the ice used in freezing ice cream? 1362.
Why are sky-scrapers seldom damaged by lightning? 2007.
What are gunny-sacks made of? 1905.
Can we have light without heat? 2000.
Why are there certain kinds of wool which will not burn? 1263.
Why is basket-making called the parent of cloth making? 342.
How can a flame manufacture water? 1710.
How can boiled water be kept from tasting "flat"? 1715.
Why if a mosquito bites you, should you let it finish its meal? 2338.
Is the American "nickel" made of nickel? 2506.
What animals make paper? 2666.
What becomes of paper money when it is worn out? 2284.
How do mosquitoes communicate with each other? 2336.
Why do sailors' blouses have a bit of white showing at the neck? 2426.
Why is the sea salt? 2554.
Why do so many people have the name "Smith"? 2388.
What metal weighs more than half a ton a cubic foot? 2831.
What plants eat animals? 2811.
What is the difference between music and an unpleasant noise? 3278.
Why can't you send sound through a sheet of cork or a bunch of feathers? 3276.
How can you tell how far away a storm cloud is? 3277.
How did a man become famous through a soap bubble? 3267.
Why has a bubble two surfaces and a drop of water only one? 3267.
Why did the fruit growers of California import Australian lady-bugs? 3132.
If you plant a seed upside down, will the root grow upward instead of downward? 348.
Why would we have no fine silk without the mulberry tree? 2365.
What fruit gets its name from Corinth, Greece? 940.
How many earthworms are there in an average acre of soil? 1066.
If there were no horses in America when Columbus discovered it, where did all the wild mustangs that used to roam the western plains come from? 1684.
What plant gives us gum arabic? 4.
What animals have four stomachs? 663.
Where does sarsaparilla come from? 3127.
How does the destruction of forests affect the earth's moisture? 1327
What member of the grass family grows 100 feet tall? 1502.
What sort of bird's nests are used as food? 3399.
How can a clay statue be made into a marble one? 3154.
How many pieces of wood are there in a violin? 3646.
What musical instruments have no definite pitch? 2383.
How does a potter "throw" a vase? 2904.
What is porcelain made of? 2883.
What animal has a hide an inch and a half thick? 1651.
From what fish do we get caviar and isinglass? 3374.
How did an insect cost France two billions of dollars in a few years? 1501.
Why are hollyhocks less beautiful now than in your grandmother's youth? 1674.
What insect might be said to "use tools"? 3693.
If a black guinea-pig is mated with a white, what color will the offspring be? 1642.
How fast can a homing pigeon fly? 2804.
Where do clams grow so large that one of them would make a hundred gallons of chowder? 782.
How far can a rattlesnake reach when it strikes? 2978.
What snake can throw its poison from a distance? 817.
How do pearl divers in the South Seas kill an octopus when it clutches them? 943.
What deer produces a valuable material used in perfumes? 979.
Why is the barberry banished by law in some states? 3101.
How far can a jack-rabbit leap? 1583.
Which can run faster—a man or a hippopotamus? 1651.
What bird builds nests six feet across? 1053.
How did the expression "crazy as a loon" originate? 2062.
Which grows larger, the lion or the tiger? 2024.
Where do crabs climb trees? 914.
Can the porcupine "shoot" its quills at an enemy? 2883.
Why isn't spiders' silk used for making cloth? 3325.
How can you tell by looking at a mesquite tree the depth at which its roots strike water? 2201.
How does a chameleon change its color? 685.
What animal has been known to tunnel 75 yards in one night? 2278.
What plant has blossoms that open at night and wither in daylight? 563.
Does an earthworm suffer when the fisherman puts it on a hook? 1067.
Why has the penguin lost its power of flight? 2716.
Why are buzzards protected by law in the South? 550.
Where did the camellia get its name? 591.
Why are some canaries fed red pepper? 627.
What causes the phosphorescence of the ocean? 2776.
Why can't a snake close its eyes? 3257.
What animal grows out again if it is cut in half? 1067.
Why does the hepatica develop its leaves early? 1076.
Can a snake leap from the ground? 3257.
Why is cuttlefish bone put in canary cages? 627.
What animal is hatched in the sea and then travels great distances up rivers and overland to fresh water? 1089.
If a boy were as good a jumper in proportion to his size as the grasshopper, how high could he leap? 1503.
Why was the English sparrow imported into the United States? 630.
If a tiger should attack a buffalo which would probably win the fight? 527.
Why is castor oil the best lubricant for airplane engines? 657.
What animal lays as many as 60,000,000 eggs a year? 1090.
Can any animal remain standing up continuously for years? 1127.
A horse as small as a cat—was there ever such an animal? 1683.
Why do some eucalyptus trees turn their leaves edgewise to the sun? 1207.
Why wouldn't a white cat with pink eyes make a good mouser? 658.
Where do ferns and lilies and tulips grow as large as trees? 265.
Why is spruce the best wood for airplane construction? 3333.
What animal holds the speed record for running? 146. The distance record for flying? 1549.
What birds have had a monument erected to them? 1550.
What animal can eat its own weight in food every day? 402.
What animal can eat 86,000 times its original weight in 56 days? 660.
What plants are so small that 7,000 of them could lie side by side on the head of a pin? 303.
How does a bat's wing resemble your hand? 1572.
Can a hare run faster up hill or down? 1583.
Is it correct to refer to all insects as "bugs"? 1787.
What causes decay? 302.
What insect lives its entire life inside the body of another insect? 371.
Do living beings ever originate from non-living matter? 398.
What bird has the greatest wing spread? 80.
Does the century plant bloom only once a century? 42.
What four-footed animal can jump over a man on horseback? 1908.
What fish sucks the blood of other fish? 1958.
What animal can change its shape at will? 118.
What plant group contains man's best friends and worst enemies? 302.
What plant sometimes grows a foot a day? 323.
How many kinds of animals have scientists classified? 127.
What insects build houses as high as a two- story house? 143.
What animal wears a flexible "coat of mail"? 211.
What tree covers such an area that it could shelter 7000 people under its branches? 329.
What sea animal propels itself by sucking in and squirting out water? 3133.
Why are both eyes of the flatfishes on the same side of the head? 1290.
What living trees are believed to be 5000 years old or more? 3176.
What fish has to turn on its back to seize its prey? 3196.
Why does the shrike hang its victims on thorn or fasten them in some other way before tearing them to pieces? 3225.
What insect stores away paralyzed caterpillars to feed its young? 3692.
What animal strikes the ground with its hind feet ahead of its fore feet when running? 1583.
How far can a lion spring? 2024.
What animal can look over its shoulder with one eye and straight ahead with the other? 685.
What animal has a tongue half as long as its body? 685.
Why does red clover grow thickest where there are cats? (See text facing 358).
What insect "rows himself through the water upside down"? 3696.
Does handling toads cause warts? 3506.
How many beats a second does a fly's wing make when it is flying? 1313.
What water plant has leaves large and strong enough to support a man? 3699.
What animal sometimes sleeps standing up and leaning against a tree? 1464.
How far can the flying-fish fly? 1314.
What bird has a cylindrical tongue? 3780.
What worms may grow as long as 30 feet? 3813.
How fast can a duck fly? 1044.
Where have monkeys been trained to tend sheep? 2292.
How does a clam betray itself to a fisherman? 782.
What is the tallest living animal? 1463.
Of what animal do we eat only the muscle? 3134.
How large is a crocodile when it is first hatched? 923.
Why would Africa probably have been conquered for civilization ages ago but for the mosquito? 2334.
What disease is transmitted by the tsetse fly? 3546.
What is the best wood for making gun-stocks? 3667.
Why are cassowaries rarely found in zoos? 654.
What is the wood of the buckeye used for? The nuts? 523.
What are the best woods for making tool handles? 225.
What wood makes the best charcoal for gunpowder? 85.



# PHYSICAL SCIENCES



UNDER the name "Physical Sciences" are included those branches of knowledge which deal with the structure and behavior of the "dead" matter of the universe, that is, matter considered apart from "vital" or life energy and coördination. The principal physical Sciences are **Physics, Chemistry,** and **Astronomy,** but there is no sharp line dividing one from the other, and indeed there is in practice no sharp line dividing the Physical Sciences from the Biological Sciences, for we have such departments as Biological Chemistry or Biochemistry, as it is sometimes called. Because of the countless technical principles involved in the Physical Sciences, it is obviously impossible to present here anything more than a brief survey of the primary points in each field.

## Physics

I. **DEFINITION:** Because any short definition would include other sciences, Physics is best defined by stating its basic doctrines and the goal it strives to attain.

A. **Nature of the Physical Universe:** Physics assumes that the physical universe consists of three elements: **(1) Matter,** the substance of tangible objects; **(2) Ether,** an elastic intangible substance pervading all space, providing, so to speak, a medium through which force is transmitted across space; and **(3) Electricity,** a force of unknown nature which, generally speaking, is the "driving force" of the universe.

B. **Character of Physical Laws:** Physics assumes that Matter, Ether, and Electricity act together according to definite, discoverable laws. Physics therefore has for its goal the explanation, with mathematical exactness and in conformity with these laws, of all phenomena of the inanimate universe.

**Note:** Physicists now are trying to reduce this simple concept of the physical universe still further, by combining Electricity and Matter in a single concept which considers Matter a form of Electricity (256). A considerable number also are trying to explain the physical phenomena of the universe without using the idea of an Ether. Both movements are still too highly theoretical to be discussed in this Outline.

### THE BASIC LAWS OF PHYSICAL ACTION

I. **THE LAW OF CAUSATION:** Physics assumes that everything which takes place in the physical universe is the result of causes, exactly proportional to the effect produced.

II. **NEWTON'S THREE LAWS OF MECHANICAL ACTION: 2190.**

III. **THE "CONSERVATION OF ENERGY" LAW: 1148.** This doctrine states that, in any physical phenomenon, energy is only transformed, and never is lost.

IV. **THE "CONSERVATION OF MASS" LAW: 2786.** This principle holds that, in any physical phenomenon, matter is merely transformed and is never destroyed.

### NATURE AND PROPERTIES OF MATTER

I. **BASIC PROPERTIES OF MATTER:**

A. **Extension or Volume:** Every material thing in the world takes up some room in it.

B. **Mass:** The quantity of matter in a body. This is indicated by the amount of force necessary to produce a given amount of motion in the body in a given time. The Mass of a body is constant. It is the Mass of a body which gives it Inertia (see below). The symbol used in physical formulae to indicate Mass is **m.**

C. **Weight:** The downward pressure which a body exerts in response to **Gravity.** Weight depends both upon the *force of gravity* at the place of measurement, and the *mass* of the article weighed. If a body of given mass be placed at different distances from the center of the earth, its weight will vary (1508), while its mass remains constant.

D. **Density:** The Weight of a substance per unit of Volume. When we say that lead is "heavier" than cork, we mean that it has a greater Density, or, in other words, that a cubic inch of lead weighs more than a cubic inch of cork.

E. **Inertia:** The tendency to "stay put," either motionless or in straight-line motion at uniform speed, until some definite force causes a change. Newton's first law of motion (2190) is sometimes called the Law of Inertia.

F. **Other Properties:** Elasticity, Plasticity, Cohesiveness, Adhesiveness, Malleability, Ductility, Hardness.

II. **STATES OF MATTER:** Physics considers only three states, or conditions in which matter may be found—**Solid, Liquid,** and **Gas.**

A. **Solid:** A solid possesses a definite mass, a definite size or volume, and a definite shape.

B. **Liquid:** A liquid possesses a definite mass and a definite size or volume, but has no definite shape. That is, a liquid alters its shape to correspond to that of its container.

C. **Gas:** A gas has definite mass only. A gas not only changes shape, like a liquid, but it does not remain, as liquids do, within any definite volume. It dissipates in all directions whenever it has a chance (1403).

III. **TRANSFORMING ONE STATE OF MATTER INTO ANOTHER:** Such transformations, as from solid to liquid, and from liquid to gas, are produced either by heat, chemical action, or radio-activity.

IV. **MECHANICS—THE EFFECTS OF FORCE UPON MATTER: 2187.**

A. **Nature of Force:** Force is "pull, push, pressure, tension, attraction, or repulsion." Therefore, to exert force, a body must meet resistance. In flying through an absolute vacuum, a bullet exerts no force whatever. In flying through air, it exerts force only in pushing aside the air. That is, force is exerted by a moving object *only in the quantity necessary to overcome resistance.* This is the meaning of Newton's Third Law of Motion (2190), that reaction is always equal and opposite to action.

a. **Units of Force:** The unit of Force in physics is the **dyne.** A dyne is a force sufficient to impart, in one second, a speed of one centimeter a second to a body weighing one gram. The dyne, therefore, is a unit in the metric or "centimeter-gram-second" (C. G. S.) system of units. The amount of force, which, acting on a pound, will produce at the end of a second, motion of one foot a second, is called a **poundal.** This is the unit of force in the "foot-pound-second" system of units. The symbol of force in physical formulae is **F,** and is understood to be Force expressed in dynes.

b. **The Force of Gravity:** Since in one second gravity imparts a speed of 980 centimeters a second to a gram of matter, the force of gravity is 980 dynes.

B. **Quantity and Measurement of Force:** Since force is called forth by reaction, the amount exerted may be measured by the reaction or "effect" produced. This is done by multiplying the mass of the body affected, by the **acceleration** produced. In symbols, it is expressed as $F = ma$, in which **a** is the symbol for acceleration, being defined below. This relation, expressed in Newton's Second Law of Motion (2190), may be called the foundation of mechanics.

C. **Composition of Forces:** When two or more forces act on a body at a given point and at the same time, the result is the same as if a single force, called the resultant, were applied. The process of finding the resultant of two or more component forces is called the "composition of forces."

a. **Determination of Resultant:** The resultant depends upon the angle between the component forces.

b. **The Parallelogram of Forces:** If a parallelogram be constructed in which the sides are drawn to scale, so as to represent the true proportions between two component forces, and if the angle between the sides be made equal to the angle between the component forces, then the diagonal which intersects that angle will represent, on the same scale, the resultant of the two forces. If there are three or more component forces, compound the first two and get the resultant, then compound this with the third force and so on until all have been compounded.

D. **Resolution of Forces:** Division of a known force into the component forces causing it is called "resolution of forces." It is performed by working the parallelogram of forces backward.

E. **Kinds of Motion:**

a. **Translation:** The change of position of the whole body in some direction. Example: An arrow in flight.

b. **Rotation:** The turning of a body about a stationary axis. Example: A fly-wheel.

c. **Vibration or Undulation:** To-and-fro motion of parts which does not change the position of the whole. Examples: a plucked banjo string, waves on the surface of water.

F. **Qualities or Attributes of Motion:**

a. **Speed:** Speed in physics means the speed of a moving body, *at any particular instant.* In order to define speed simply, assume an object traveling at a uniform speed. Measure the distance traveled in a given time, and divide this distance by the time. The answer is the speed. In symbols, $S = \frac{x}{t}$. (**S** is the customary symbol for speed, and **t** for time; **x** has been used for distance traveled.)

b. **Velocity:** Velocity is speed *with reference to a given direction.* If, for example, we regard westward movement as positive, an eastward movement will have negative velocity. The symbol for velocity is **v.** Velocities may be "compounded" and "resolved" by the parallelogram method.

c. **Acceleration:** When a train starts, its velocity, or speed in a given direction, changes constantly. The rate of this *change* is called **Acceleration.** We determine acceleration by measuring the velocity at any given instant and again a few instants later. The difference is the acceleration over the period of time. The answer may be obtained by using the following formula: $a = \frac{v_2 - v_1}{t_2 - t_1}$ ($v_1$ and $t_1$ are the velocity at the first observation and the time of taking it, while $v_2$ and $t_2$ are for the second observation.) The acceleration produced by Gravity (symbol **g**) at the surface of the earth is approximately 32.2 feet or 980 centimeters a second (1508).

G. **Attributes of a Body in Motion:**

a. **Momentum:** The amount of force required to set a body of a given mass in motion at a particular speed, or what is the same thing, the amount of resistance required to stop the body when once it is moving at that speed. Both the mass of the body and its velocity determine its momentum. In symbols, momentum is usually expressed as **m v** (**mass** times **velocity**).

b. **Kinetic Energy, or Striking Power:** The *striking power* of a moving object, as opposed to its *momentum* is $\frac{1}{2}mv^2$.

c. **Centrifugal and Centripetal Force:** As stated in Newton's first law, a moving body will continue to move in the same straight line unless forced to do otherwise. In order then to swing a stone at the end of a string, we must apply force to keep the stone in a curved path. This force is supplied by the string. The resistance to curving offered by the stone is called *centrifugal force* (682) and the restraining force of the string is called *centripetal force.*

H. **Determination of Work, Power, and Energy:**

a. **Nature and Measurement of Work:** In physics, **Work** upon a body is defined as the amount of motion, or the strain, compression, or distortion produced in it. No matter how great the force exerted, work is not done if the point of application does not move. Atlas holding the world on his shoulders was doing no work, according to the physical definition of work. The amount of work is the product of the force exerted by the distance traversed. In symbols, work is equal to **F X** where **F** is the force and **X** is the distance. The engineering unit of work is the **foot-pound,** the amount of work required to raise one avoirdupois pound a foot against gravity. The scientific unit is the work required to move a gram one centimeter against a resistance of one dyne. This unit is called an **erg.** Since it is so small, a **joule,** or 10,000,000 ergs, is often used.

b. **Nature and Measurement of Power:** Under the definition of work given above, the work is the same if an object be moved a foot in a second or an hour. In ordinary life, however, the time element is important; and **Power** is force which does certain work *in a certain time.* In physics the unit of power is **an erg a second**—that is, the force which will move one gram one centimeter in one second against a resistance of one dyne. A larger unit is a joule a second, and is called a **watt.** This watt of mechanical power corresponds to the watt of electrical power (1116). The customary engineering unit is the **horse-power** (3349). The horsepower is equivalent to 746 watts.

c. **Nature and Kinds of Energy (1148):** Energy is defined as the *capacity for doing work.* A hanging weight has capacity for doing work whenever it may be let fall. This "stored energy" is called **Potential Energy:** When falling, the weight has the capacity for doing work upon any object getting in its way. This energy is called **Kinetic Energy.**

d. **Measurement of Energy:** The amount of *potential energy* stored by raising an object against gravity, is **m g h** (**mass** of the object, times **force of gravity** in dynes, times **height** to which the weight is raised).

I. **Properties of a Body at Rest—Statics: 2189.**

a. **Balanced Forces:** Since gravity acts everywhere, every motionless body is constantly subject to two forces—the force of gravity and the corresponding resistance of the foundation upon which the body stands. The body is motionless because the resistance is equal to the downward pull. That is, the opposing forces are "balanced." A magnet holding up a piece of iron is another example of balanced forces. The science dealing with balanced forces is called **Statics.**

b. **Center of Gravity:** So long as a body remains structurally rigid, all its weight may be considered as concentrated at one point, called the **Center of Gravity** (1509). The center of gravity always tends to get as low as possible. If therefore a body be suspended by an edge or corner, the center of gravity will be vertically below the point of suspension, this being the lowest attainable position.

c. **Equilibrium:** The condition called Equilibrium—that is, lack of motion—exists in a body when the sum of all forces acting upon it in one direction equals the sum of those acting upon it in the opposite direction.

J. **Principles and Characteristics of Machines:**

a. **Purpose of Machines:** In the broad sense a machine is (**1**) a device for transforming energy from one kind to another, such as a gasoline motor; (**2**) a device for transferring energy from one place or direction to another, such as the driving rod of a locomotive; (**3**) a device for changing the relative speed and strength of action of a force, such as a block, and tackle.

b. **The Law of Machines and the Principle of Mechanical Advantage:** Since energy can neither be created nor destroyed, we can get out from a machine only the energy we put into it. In the simplest type of machine—the force "put in" is measured by its amount in dynes, times the distance over which it moves, and the work done is measured by the weight moved times the distance moved. Ignoring losses caused by friction within the machine, these two quantities must equal each other. This equality is the **law of machines,** which may be stated in symbols thus: **F x = m d.** (**F** is the force put in, **x** the distance over which it operates, **m** is the mass of the object moved, and **d** the distance over which it moves.) Although we can get out of a machine only the energy we put into it, we can make it move a small weight over a large distance, or a large weight over a small distance. The amount by which the weight-lifting power of a machine is multiplied, at a corresponding loss in distance lifted, is called its **mechanical advantage.**

c. **Six Types of Machines in Physics:** The six types of machines known to mechanics are the **lever, wheel and axle, pulley, inclined plane, wedge,** and **screw.** Each type is explained in the article on

Mechanics (2187). All machines used in our industries, insofar as they involve the transformation of mechanical energy, are combinations of these simple types.

K. **Values and Disadvantages of Friction: 1370.** Allowance for friction loss must always be made when computing the power of machines from the energy applied.

V. **EFFECTS OF FORCE UPON LIQUID MATTER—HYDRAULICS:**

A. **Definition and Subject Matter of Hydraulics.** Hydraulics is the Science of Force in Liquids. Since gases at low velocities have many of the properties of fluids, those principles of Hydraulics which describe the behavior of pressure are also applicable to gases, not in rapid motion. Hydraulics is divided into two branches, depending upon whether the liquid considered is at rest or in motion, as follows: (1) **Hydrostatics,** or the science of liquids at rest; (2) **Hydrodynamics,** or the science of liquids in motion. Since the problems of hydrodynamics—problems such as the design of water turbines, the theory of vortices in flowing streams and so on—require the use of higher mathematics in their solution, the discussion in this Outline will be confined to Hydrostatics.

B. **Pressure and Flow:** Aside from gravity, the great force causing phenomena within liquids is **Pressure.** Pressure arises from: (1) Atmospheric pressure upon the surface of the liquid; (2) The weight of overlying liquid; and (3) Cohesion, or the tendency of molecules to adhere, within the liquid. The usual symbol of pressure is **P.** In this connection it is well to remember that all liquids are virtually "incompressible," that is, they cannot be forced at a given temperature into a smaller space than they normally occupy.

a. **Qualities and Attributes of Pressure:**

1. **Pressure Due to Atmosphere:** This is computed by multiplying the total area of the surface by the atmospheric pressure. This pressure is the same throughout the liquid.
2. **Pressure Due to Gravity:** Since weight is merely downward pressure caused by gravity, the gravitational pressure at any level is the weight of the vertical column of liquid above that level. Since liquids tend to move sidewise as well as downward, this pressure acts equally both downwards and sidewise at any given level against the walls of the container. Pressure against a side is always exerted at right angles to the side, no matter what the slope of the side may be.
3. **Uniformity of Pressure throughout a Liquid:** If the pressure upon a confined liquid be increased by a certain amount at any point, the liquid will transmit that same increase of pressure equally throughout its whole extent. It is this principle which makes possible the Hydraulic Press (1710, 1709 picture). The name "hydrostatic paradox" is applied to the fact that such devices as the hydraulic press appear to "create" energy. Such is, of course, not the case, since the distance moved by the larger piston decreases in direct proportion to the increased force it exerts.
4. **Uniformity of Levels in Connecting Vessels:** The uniformity of pressure within liquids explains why a liquid remains at the same level in connected open vessels no matter what their relative size.
5. **Principle of the Siphon: 3243.**

b. **Phenomena of Immersion:**

1. **Principle of Archimedes:** This principle (174, 1509) states that **a body immersed in a fluid is buoyed up by a force equal to the weight of the fluid it displaces.**
2. **Why Some Bodies Sink and Others Float:** A liquid buoys the body up; the body's weight forces it down. If its weight is greater than the weight of the water it displaces, the downward force will be the greater and it will sink. But if the body's weight is, for instance, only half that of an equal volume of water, it ceases to sink when half of its volume is immersed, the upward thrust of the displaced water then being equal to the downward thrust of its weight. This principle is utilized in the Hydrometer (1711).

c. **Cohesion and Capillarity:** The molecules of a liquid "stick together" with appreciable force. This "clinging tendency" is called **Cohesion,** and creates a force called **Surface Tension** on liquid surfaces Surface tension causes the phenomena of **Capillarity** (641).

1. **Surface Tension:** Within a liquid, every particle is drawn in all directions by the cohesiveness of its neighbors. At the surface, however, only those particles *below* and at the sides exercise attraction. The result is a definite *pull* toward the center of the liquid. If gravity did not interfere, this pull would bring each portion of the surface to an equal distance from the center, thus drawing the liquid into a sphere. This actually happens in the case of raindrops, where every particle is already responding fully to gravity—and surface tension has a free hand in forming the water into droplets. Soap bubbles (3267) are still another example.
2. **Curvature of Surface:** Surface tension causes the curved portion or **meniscus** which adjoins any solid surface rising from a liquid. Menisci are of two kinds: (1) when the liquid wets the solid—that is, when particles of the liquid will adhere to the solid—a portion of the liquid always gets above the general surface level, then attracts nearby particles of liquid toward it. The process continues until the downward pull of gravity upon the raised liquid equals the upward pull of the elevated particles. The resulting meniscus will be concave; (2) when the liquid does not wet the solid—as when glass dips into mercury—a convex meniscus is formed, for then the liquid obeys as far as possible the tendency mentioned above of forming itself into a sphere.
3. **Capillarity in Small Tubes:** If the diameter of an upright tube standing in a liquid be small enough so that menisci on each side join or nearly join in the middle, their pull is sufficient to raise or depress the general level of the liquid in the tube from that of the surrounding liquid.

If the liquid wets the tube, capillarity will draw it upward; if it does not wet the tube, capillarity will force it downward.

VI. EFFECTS OF FORCE UPON GASEOUS MATTER—PNEUMATICS:

A. **Relation of Pneumatics to Hydraulics:** Hydraulic principles relating to fluid pressure apply also to gases not in motion. They need not, therefore, be restated here as applied to gases. Typical laws are those of pressure upon containers and Archimedes' principle. Since gases are compressible, principles involving the incompressibility of liquids, such as the hydrostatic paradox, are not applicable.

B. **Nature of Gaseous Pressure:** The general nature of gaseous pressure is explained on page 1403.

C. **Relations of Temperature, Pressure, and Volume:** As may be understood from considering the molecular nature of gases (1403) and the molecular nature of heat (1618), the temperature, pressure, and volume of a gas are intimately dependent upon each other, as follows:

a. **Boyle's Law: 1403.** This law states that, at a given temperature, the volume of a gas decreases in proportion as pressure increases. This law may be stated as a proportion: $\frac{P_1}{P_2}=\frac{V_2}{V_1}$, in which $P_1$ is the initial pressure and $P_2$ is the added pressure; $V_1$ is the initial volume and $V_2$ is the volume due to the added pressure.

b. **Charles's Law:** This law asserts that, if the same pressure is maintained, the volume of a gas increases regularly with increase in temperature. The amount of increase is called the coefficient of expansion, and is, for all gases, almost exactly $^1/_{273}$, or 0.003662 of the volume for each degree of temperature on the Centigrade Scale.

D. **Avogadro's Rule:** Avogadro's Rule states that equal volumes of gases at equal temperatures and pressures contain an equal number of molecules, whatever the gases may be. The rule is of immense importance in chemistry in determining atomic weights. Although Avogadro deduced it from the results of chemical experiments, the rule may be proved by calculating the behavior and properties of the molecules within a gas, by means of higher mathematics.

E. **Atmospheric Pressure and the Barometer:** These subjects are discussed in the articles on Air (50–3) and Barometer (332).

## HEAT AND ITS PRINCIPLES

I. **NATURE OF HEAT:** According to modern theory, heat is *motion* of the molecules within a substance (1618), and the amount of heat present is determined by the total amount of motion present. When there is no motion, there is no heat—that is the body is at **absolute zero** (1618) in temperature. The theory that heat is a consequence of molecular motion is called the **kinetic theory of heat.**

II. BASIC LAWS OF HEAT:

A. **Principle of the Conservation of Energy:** 1148, 1618.

B. **Principle of the Dissipation of Useful Energy (Carnot's Principle):** Common sense tells us that heat cannot of itself pass from a colder to a hotter body. This fact, seemingly trivial, is really tremendously important. It means, for instance, that if we want to heat a body, we cannot do so by transferring a portion of their heat from colder bodies and so "build up" heat. We must do so by abstracting heat from a still hotter body, or by using chemical energy such as we have in unburned coal, or potential mechanical energy such as we have in a raised hammer. All the theories and causes of Physics must agree with this principle, that heat always "runs down."

III. ATTRIBUTES OF HEAT: Since heat is molecular motion, the amount present in a body depends upon two factors: (1) the average *speed* of the moving molecules, and (2) the *number* of moving molecules. If we keep this in mind, the phenomena of heat will be much more easily understood.

A. **Temperature:** Temperature is the "relative hotness" of any body, as compared with any convenient standard, the most convenient being the comparison of the expansion produced in some substance by the temperature in question with the known expansion produced by some standard temperature. Instruments for doing this are Thermometers (3486) and Pyrometers (2941). The "absolute scale" of temperatures based upon "absolute zero" or complete lack of the molecular motion which produces heat is often used in science (1618).

B. **Specific Heat:** It takes more energy to raise the average speed of the molecules—that is to raise the temperature—in substances where they are bound tightly by physical or chemical forces, than it does in others. The amount required to raise a given substance's temperature one degree, as compared with the amount required for the same mass of water, is called the **Specific Heat** (1620) of the substance. Water is used as standard with a value of 1 because its specific heat—that is the amount of energy required to raise it one degree in temperature—is the greatest known. Specific heats of other substances are therefore always less than one.

C. **Latent Heat:** A parallel to specific heat is **Latent Heat,** or the heat required to change the physical state of a substance (3696), as in changing ice to water. While a body is absorbing latent heat, its temperature remains unaltered. When the change is reversed, as in changing water to ice, the latent heat is *given out* by the changing substance.

D. **Measurement of Heat:** Since the quantity of heat, or amount of molecular motion in a substance, depends upon (1) its temperature, (2) its mass, and (3) its specific heat, the unit of heat quantity must contain these quantities. The commonest units are the **lesser calorie** (1620), employed in scientific computations, the **greater calorie** (1320) employed in computing food values, and the **British Thermal Unit** (1620) employed in engineering.

IV. EFFECTS OF HEAT ON MATTER:

A. **Expansion and Contraction:** Since heating a body gets its molecules to moving faster, they push each other farther apart, and the substance as a whole expands somewhat. The amount of expansion produced by a given amount of heat, as compared with the original bulk of the substance, is called its coefficient of expansion.

a. **In Solids:** Practically all solids expand at a uniform rate as heat is applied, up to the point where they become liquid. The alloy invar (2507) is valuable because of its remarkably low coefficient of expansion.

b. **In Liquids:** All natural liquids except water expand uniformly, the amount depending upon the kind of liquid. This behavior of water is explained on page 1618 (picture) and on pages 3693–4.

c. **In Gases:** Practically all gases, irrespective of their chemical nature, have the same coefficients of expansion, as explained under Pneumatics, "Boyle's Law."

B. **Change of Physical State:** When sufficient heat is applied, matter changes state. That is, because their particles are speeded up, solids become liquids and liquids become gases. Loss of heat reverses the process. Details are given in the articles on Freezing (1361) and Evaporation (1207).

a. **Change from Solid to Liquid:** Melting points, or the temperatures at which the change from solid to liquid takes place, are given for common substances on page 1362. Obviously, melting points are also the "freezing points" at which cooling liquids become solids (1361).

b. **Change from Liquid to Gas:** This change is accomplished by: (**1**) Evaporation, (**2**) Boiling or Ebullition, and (**3**) Explosion. In **Evaporation** (1207), minute particles of liquid shoot off from the surface into surrounding space, thus transforming the liquid gradually into vapor. **Boiling** is a form of evaporation so violent that it takes place not only on the surface but within the liquid, giving rise to bubbles of vapor (see Distillation 1014). **Explosion** is a change so violent that the liquid "bursts," so to speak, into gas all at once. The reverse process, by which gas is transformed into liquid, is called **Condensation,** discussed under Dew (1000).

c. **Change from Solid to Gas:** This process with the intermediate liquid stage omitted, is comparatively rare. It is seen however in the case of explosions (1211). The reverse process is an extremely rapid condensation.

C. **Transmission of Heat:** Heat is transferred by Conduction, Convection, and Radiation, as explained on page 1619.

D. **Machines for Transforming Heat into Work:** Familiar devices for doing this are Steam Engines (3348) and Gas Engines (1403).

## SOUND AND ITS PRINCIPLES

I. NATURE OF SOUND: **3276, 2786.** Sound is carried by longitudinal or "compression" waves (3706) in elastic matter. Although the most usual medium is air, any solid or liquid can transmit sound, provided it is elastic and therefore capable of vibration (3276).

II. VELOCITY OF SOUND:

A. **General Law of Velocity:** In any medium the velocity varies directly as the square root of the elasticity and inversely as the square root of the density of the medium.

B. **Some Figures for Sound Velocity:** Hydrogen, one sixteenth as dense as oxygen, carries sound four times as fast as oxygen (4190 feet a second in hydrogen at 0° C.). Liquids, though denser than gases, are still more elastic, and therefore convey sound more rapidly (4,730 feet per second is the rate in water). Elastic solids are best of all (nearly 11,000 feet a second is the rate in pine wood, more than 12,000 feet a second in copper, and more than 15,000 feet a second in iron). All these speeds are at a temperature of 0° C.

III. REFLECTION OF SOUND: **3278.**

A. **Echo: 1073.**

B. **Whispering Galleries: 3278.**

IV. REFRACTION OF SOUND: Sound is bent or **refracted** whenever it passes obliquely from one medium into another, in which its velocity is different. The direction of refraction may be determined as follows: If a perpendicular to the surface separating the media be assumed, the sound wave will bend away from the perpendicular if passing into a medium where its velocity is greater, and toward the perpendicular if its velocity is retarded.

V. DISTINCTION BETWEEN TONES AND NOISES: If the pulses of a sound wave are regular, they produce an effect upon the ear (1057) which we call a "tone." If the wave is "all jumbled up," it causes a "noise" (3278).

VI. PROPERTIES OF TONES:

A. **Pitch:** By Pitch is meant the relative "highness" or "lowness" of a sound. The pitch of a note depends upon the **rate of vibration** (3278).

B. **Intensity:** Intensity or "loudness," depends upon three factors: (**1**) The power of the original pulse (3277), (**2**) the distance from the source of sound (3277); and (**3**) the density of the transmitting medium. A pistol shot produces a feeble sound in the rarefied air of a high mountain top.

C. **Tone-Quality or Timbre:** That quality which distinguishes a note played on a violin from the same note played on a flute is called "tone-color" or "timbre." The different qualities of the instruments are given by **overtones** (3278).

D. **Effect of Motion on Pitch:** When the source of sound is approaching rapidly, the pitch rises; when the source recedes, the pitch falls. This is known as Doppler's Principle (3277).

VII. PRODUCTION OF TONES:

A. In Strings:

a. **Effect of Length:** Tension and diameter being constant, the vibration rate (which determines pitch) varies inversely as the length.

b. **Effect of Tension:** Length and diameter being constant, the vibration rate varies inversely as the square root of the tension.

c. **Effect of Mass:** Length and tension being constant, the vibration rate varies inversely as the square root of the mass of a unit length. Mass is determined by the material and the diameter of the string.

d. **Tuning:** Since in any stringed instrument the length, material, and size of each string is fixed, tuning is accomplished by varying the tension.

B. **In Enclosed Columns of Air:** In wind instruments (2383) the pipe or tube acts as a resonator for vibrations produced in the air blown into them.

a. **Effect of Length:** Vibration rate and therefore pitch vary inversely as the length of the vibrating air column. Thus, doubling the length gives a tone an octave lower. Manipulation of "stops" on the enclosing pipe enables the player to vary the length of the vibrating column, and therefore the pitch of the note emitted.

b. **Open and Stopped Pipes:** An open pipe gives a tone an octave higher than a stopped pipe of the same length.

c. **Voice: 3656.** The human vocal organs are a type of reed instrument in which the vocal cords are the reeds.

VIII. PHENOMENA OF COMBINED TONES:

A. **Forced Vibrations:** When a strongly vibrating agent is pressed against another, the second is forced to vibrate in agreement with the agent pressed against it, regardless of what its natural vibration rate might be. Such a vibration is a **forced vibration.** Stringed instruments use forced vibrations of sounding bodies to amplify the sound produced by the strings themselves. The sounding board of the piano, and the wooden shells of the guitar, violin, mandolin, and ukulele, are examples.

B. **Sympathetic Vibrations:** Forced vibrations are produced by strong external force. A slight force, however, is quite enough to set a vibrating agent going **in its own period.** Even slight air pulses, carrying a tone of the proper vibration rate, or even a strong overtone, are enough. Vibrations caused thus are called **sympathetic vibrations.**

C. **Resonance:** When one vibrating body sets another in sympathetic motion, the second emits pulses which in turn help the first. Such a "building up" is called resonance. The so-called "sound of the sea" in a shell held to the ear, is a case of resonance reinforcing whatever faint sound is in tune with the period of the air enclosed in the shell. Complex tones may be resolved into fundamental and overtones, by using "Helmholtz resonators" or artificial shells of different known periods. Each "shell" reinforces the overtone with which it is in unison, and thus enables all overtones to be picked out.

D. **Interference:** Two waves with the same characteristics travelling in opposite directions, "cancel" each other when they meet. Such a "cancellation" is called interference. "Soundless zones" have been produced accidentally where reflected sound from a fog signal meets and interferes with the sound direct from the signal.

E. **Beats:** If two adjoining instruments are sounding nearly but not quite the same note, we get alternate resonance and interference. At first the two pulses reinforce each other and we have resonance; then the vibrations of the lower-pitched instrument lag until they are half a vibration behind, whereupon the vibrations oppose each other and we have interference. When the "lag" amounts to a full vibration, we have resonance again—and so on. This alternate resonance and interference produces a pulsing quality which musicians call "beats," in the combined tones.

F. **Musical Intervals and Scales:** For some psychological reason, tones whose vibration rates bear simple ratios to each other are pleasing to us when played in various combinations.

a. **Musical Intervals:** The simpler musical combinations of tones are called Octaves, Thirds, Fifths, etc. When a note has twice the vibration rate of another, it is said to be an **octave** above the other. For example (C to the next higher C). When the rates are in the ratio of two to three, the interval is a **fifth** (C to the next higher G). A ratio of 3 to 4 gives a **fourth** (G to C above); one of 4 to 5, a **major third** (C to E); one of 5 to 6, a **minor third** (E to G); and one of 24:25, a **chromatic semitone.** When one note is sounded after another, they form an **interval;** when sounded together, a **chord.**

b. **The Diatonic Scale or Gamut:** If, between the two notes of an octave we insert a selection of note with simple intermediate rates of vibration, we have a pleasing succession of tones known as a **scale.** In the so-called **diatonic scale,** the notes, beginning with C for the lower end of the octave, are as follows, the vibration ratio of each note to the one next above it being given in parentheses: **C** (vibration ratio with D, 8 to 9); **D** (ratio with E, 9 to 10); **E** (ratio with F, 15 to 16); **F** (ratio with G, 8 to 9); **G** (ratio with A, 9 to 10); **A** (ratio with B, 8 to 9); **B** (ratio with upper C, 15 to 16). Each of these intervals has one of three values: 8 to 9, called a **major tone;** 9 to 10, a **minor tone;** 15 to 16, a **major semitone.** The C upon which the scale begins is called the **fundamental** of the scale, and the other notes are the second, third, etc., up to the next C, which is the eighth, or octave. A **sharp** is a note raised by a chromatic semitone and a **flat** is a tone lowered by a chromatic semitone. Chromatic semitones may be inserted between all tones of the scale except in the two "major semitone" intervals (E to F and B to C).

*consult the Easy Reference Fact-Index at the end of this work*

c. **The Tempered Scale:** Each note in a scale may be made the keynote of another scale with intervals represented by precisely the same ratios as those in the original scale. Thus, we can take E (the third note in the scale of C) and upon it as a fundamental, erect a "scale of E," giving each note its proper vibration ratio. But if we do this, we find that the two scales do not "go up" together. For example, the "sixth" or C in the scale of E would not have exactly the same vibration rate as upper C in the C scale. In order then to play with complete accuracy in any "key" upon a piano, we should need separate strings and keys for each scale. This difficulty is avoided by using the so-called **tempered scale,** in which the vibration rates of nearby tones in each scale are "averaged," and the strings are tuned to this average value. By accepting the slight irregularities thus produced, we can make one piano do for any key.

d. **Vibrations of Rods, Plates, Bells, and Membranes:** The laws governing such bodies usually are exceedingly complex. Their study is aided in many cases by scattering sand over the surface of a vibrating plate. Under the influence of vibration the sand rearranges itself in various designs (3277 picture).

## PHENOMENA AND PROPERTIES OF ETHER

I. **GENERAL NATURE OF ETHER:** The general nature of **Ether** as a weightless, elastic, and intangible substance is described on page 1180.

II. **HISTORY OF THE ETHER THEORY:** The idea of such a substance as Ether was first propounded by Huygens in 1690 in order to explain light (1998) and was accepted when Young and Fresnel, in the first 20 years of the 19th century, overthrew Newton's "corpuscular theory" of light. Clerk-Maxwell changed the theory somewhat, but identified light with certain phases of electricity (1122). None of these men devised any direct proof that ether exists, other than to show that such a medium was the best explanation of the phenomena.

## LIGHT AND ITS PRINCIPLES

I. **NATURE AND PROPAGATION OF LIGHT:**

A. **Light as a Form of Wave Motion in Ether:** 1998, 1180, 3706, 3276.

B. **Cause of Light Waves:** The waves which transmit light apparently are caused in some unknown manner by vibrating molecules of matter. Usually the necessary vibration is set up in matter by heat (1998); but it occurs in some forms of organic matter without heat, and such light is known as *phosphorescence* (2776, 2000).

a. **Luminous and Non-Luminous Bodies:** Luminous bodies are those like the sun, which have sufficient energy in their natural state to emit light. Other bodies are naturally non-luminous, and are distinguished, with reference to their behavior toward light, by one of the following three properties:

1. **Transparency:** Substances like clear air, water in thin layers, and glass, let the light pass through so freely that we can see objects in them on the other side of them. Such bodies are **transparent.**
2. **Translucency:** Substances like horn, colored and ground glass, fine porcelain, and paper, transmit light, but not clearly enough to permit objects on the other side of them to be seen distinctly. Such bodies are **translucent.**
3. **Opacity:** Substances like wood, stone, and cold metal block the passage of light. Such bodies are **opaque.**

C. **Velocity:** The speed of light and its measurements are described on page 1997.

D. **The Path of Light:** In all ordinary light phenomena, such as casting shadows, behavior in lenses, etc., light seems to travel outward from its source in straight lines, like the ribs of a fan. It was this fact that led Newton to accept the corpuscular theory (1998). This "straight-line" propagation is really due to the exceedingly small size of light waves. Although light is carried by waves, and not by "straight-line" rays, as Newton imagined, the "ray" idea is very useful in many explanations. Whenever we use it, we mean a line **perpendicular to the wave front at the point considered**—that is, a radius prolonged. When we say that a "ray" is bent, we really mean that the geometric center of the wave-front has shifted.

E. **Intensity of Light:** The intensity of light at the origin depends upon the energy of the disturbance creating it. This disturbance spreads out in all directions, so at any given distance the energy may be regarded as distributed around the circumference of a circle whose radius is the distance. In order to compare intensity at different distances, we must therefore compare these circumferences. Since circumferences are to each other as the squares of their radii, we get the rule: **The intensity of illumination from a given source varies as the square of the distance from the source.**

—**Standard Unit of Illumination, or Candlepower:** The illuminating power of a candle made of spermaceti weighing one-sixth of a pound and burning 120 grains of its substance an hour is the standard source of light used in computing illumination in the United States. The work of measuring comparative illumination is called **Photometry.**

II. **REFLECTION OF LIGHT:** 2000.

A. **Cause of Reflection:** Since light travels outward in waves from its own source, the front of each wave is circular. When such a wave strikes a plane surface, the middle portion hits first and starts back, while the "wings" are still "coming on." Then they hit and start back; but their late arrival has caused the

wave to be "reversed." That is, instead of being convex toward the reflecting surface, the wave is now concave.

B. **Laws of Reflection:** The manner in which light is reflected is described by the following two laws:
   a. **The Angles of Incidence and Reflection are Equal: 2000.**
   b. **The Incident and the Reflected Rays Lie in One Plane Perpendicular to the Reflecting Surface.**

III. **REFRACTION OF LIGHT: 1987.**

A. **Cause of Refraction and Refractive Index:** In water, glass, and other "optically dense" substances, light moves at a velocity less than air. Therefore a light wave entering water or glass **obliquely** from air, is slowed up at the side which first enters the denser medium, and this "drag" changes the direction of the wave. The **Law of Refraction** is discussed on page 1987. The amount of refraction produced at the boundary surface of two media is called the **refractive index** for the media in question.

B. **Refraction, Partial Reflection, and Total Reflection:** In any case of refraction, only a part of the light passes from one medium into another and is refracted; the rest is reflected from the boundary surface. The portion reflected increases as the angle becomes more oblique, and at a certain value, called the **critical angle,** the refracted ray lies along the boundary surface. At angles still more oblique, all the light is reflected.

C. **Lenses and Prisms: 1986, 3311–14, 2779, 3462–3.**

D. **Spherical Aberration: 3462.**

E. **The Eye as an Example of Lens Action: 1213.**

IV. **DIFFRACTION OF LIGHT AND INTERFERENCE:** Interference is the phenomenon whose discovery, announced in 1802, overthrew the ray or corpuscular theory of light, and set up the wave theory in its place. Light waves, in passing through narrow openings or across the sharp edges of objects, are radiated out from the points of contact in paths which intersect the waves which have not been so disturbed. This is known as **diffraction.** The diffracted waves alternately reinforce and counteract the undisturbed waves in such a way as to produce bands or zones of light and dark. This phenomenon is called **interference.** Interference effects, however, are so small that they can be detected only by special apparatus. A diffraction grating (3314) is one; the interferometer (1998) is another.

V. **PHENOMENA OF COLOR:** The general nature of color and its perception in objects are given on page 837. The cause is explained on page 1998.

A. **Refraction of Color:** The amount of refraction (see "Refraction" above) caused in light depends upon its wave-length. Since difference in color is due to difference in wave-length, it follows that in a given refracting device, **each color will be refracted by a different amount.** This behavior is the cause of **Rainbows** (2972), and is taken advantage of in such instruments as the **Spectroscope** (3311). Longer waves refract less than shorter. Since red has the longest wave, it refracts the least (3312, 3311).

B. **Chromatic Aberration:** Since different colors refract differently, it follows that a convex lens focusses each color at a different point, the violet being focussed nearest the lens, and the red farthest away. This behavior is known as **chromatic aberration** (3462) and is corrected by using compound or "achromatic" lenses (3462, 1987–8).

VI. **POLARIZED LIGHT:** The behavior of Polarized Light, and some of its uses, are explained on page 2000.

VII. **X-RAYS AND RADIO:** According to present theory, these phenomena differ from light chiefly in the wave-length which carries them through the Ether (3312). The apparatus used and the peculiarities of each phenomenon are described in the articles on X-rays (3824) and Wireless Telegraphy and Telephony (3758).

## ELECTRICITY AND MAGNETISM

I. **NATURE OF ELECTRICITY: 1108.** The actual nature of electricity is unknown. Physics now assumes electricity to be caused by two kinds of minute particles called **electrons** (256, 1112, 1111 picture, 1125). The **positive electron** is comparatively large and inert, and bears a charge of so-called "positive electricity," which is merely a name for an attractive power of unknown nature. The **negative electron** is comparatively light and active, and bears a charge of "negative electricity." These charges are of such nature that "like repels like, and attracts unlike." This basic theory explains all known phenomena of electricity, both "static" and "current."

II. **PROPERTIES OF ELECTRIC CHARGES:**

A. **Creation:** Electric charges or "static electricity" is created by friction (1108, 1111 picture, 1108). It is impossible to create one kind of charge without bringing into existence somewhere, an equal charge of the opposite kind. For some unknown reason, free electrons travel readily in certain classes of substances, particularly the metals. These substances are called **conductors.** It is difficult to create charges by rubbing two conductors together, because the charges leak away. Frictional charges are best created upon non-conducting substances, known as **dielectrics** (1110).

B. **Attraction, Repulsion, and Polarity:** The mutual behavior of electric charges is summed up in the simple rule, "like attracts unlike, and repels like" (1110, 1112 picture). The sign of a charge is its **polarity.**

C. **Induction across Space:** The free electrons in a charge upset the balance between the positive and negative electrons in near-by bodies. If a positive charge be placed near the end of an insulated rod, it will attract negative electrons to the nearer end of the rod, leaving a mass of "unneutralized" or free positive electrons at the other end. When the inducing charge is removed, these effects disappear.

D. **Potential:** The "potential" of an electric charge is simply the pressure, or attractive power, tending to pull separated electrons (or "charges") of opposite signs together (1110). When two charged bodies

each have a potential of the same sign, the body of greater potential will drive part of its charge to the the other, until the two are equalized. The "driving pressure" or **electromotive force (E.M.F.)** moving the charge is the potential difference (P.D.) between the areas. If the potentials are of opposite sign, the E.M.F. is the sum of the potentials. The strength of a charge may be measured by an electroscope (1110).

F. **Electrostatic Capacity:** A considerable number of free electrons may be accommodated between the molecules of some substances, without any great upset in the "potential" of the substance. In other substances, the addition of a few electrons produces a marked change in potential. This relation between the amount of charge—that is the quantity of electrons absorbed—and the resulting change in potential is called the **capacity** of the substance.

G. **Condensers:** If a body, such as a metal plate, be charged and another plate which is connected to the earth be brought near it, the capacity of the first plate for holding electricity is increased. Such a device, which may consist of many plates separated by insulators, is called a **condenser** and is used in many practical ways, where it is desired to accumulate large electric charges.

a. **Effect of Intervening Insulator or Dielectric:** Experiments show that the "ether strain" caused by the presence of the charges takes place in the surfaces of the intervening insulator or **dielectric.** When the strain becomes more than the dielectric can bear, it ruptures, a spark passes, and the charges unite. The capacity of a condenser therefore depends in part upon the ability of the dielectric to withstand electric stress.

b. **Leyden Jars:** The oldest known form of condenser is the Leyden jar (1118).

## III. PROPERTIES OF MOVING CHARGES—ELECTRIC CURRENTS:

A. **Nature:** An electric current is simply a rush of negative electrons through a conductor. Such a rush is set up by discharging a condenser, but is over almost instantly. In order to have a steady current, we must have some means for creating charge, or potential difference, as rapidly as the rushing electrons carry the charge away. Such a current is often called **galvanic** or **voltaic** (1120).

B. **Creation of Currents by Chemical Means:** The first and simplest means of creating a galvanic current is by the chemical energy of a so-called **voltaic cell** (1120, 1109 picture, 1112–13). The two metals zinc and copper are called **electrodes,** and the sulphuric acid is the **electrolyte.**

a. **Polarization:** In the simple voltaic cell, the chemical action gradually accumulates hydrogen upon the copper plate. When a certain amount has accumulated, it blocks further action, and current output ceases. This blocking is known as polarization, and must be avoided by cleaning away the hydrogen, or using chemicals which do not produce it.

b. **Types of Cells:** A single chemical unit is called a **cell.** A group of units is a **battery.** Common types of chemical units follow: (1) **The Daniell Cell:** A zinc plate is immersed in a zinc sulphate solution contained in a porous earthen cup. The cup and a copper plate are then immersed in a solution of copper sulphate. Negative electrons then flow from the zinc, as in the voltaic cell. (2) **The Gravity Cell:** In the gravity cell, the reactions occur as in the Daniell cell, but the two solutions are kept separate by gravity instead of a porous cup. The copper sulphate and the copper plate are placed in the bottom of the cell and the lighter zinc sulphate solution floats above, surrounding the suspended zinc plate. (3) **Leclanché and Dry Cells:** A zinc rod supplies negative electrons with carbon as the positive electrode and an electrolyte of dissolved sal-ammoniac. The Leclanché is the so-called "common wet cell," while in the common "dry cell" a moist packing is substituted for the watery solution. (4) **Storage or Secondary Batteries (3361).**

C. **Creation of Currents by Heat:** Heat can be made to produce current by means of the thermocouple (1113).

D. **Creation of Currents by Mechanical Means:** This method, used in Dynamos and Generators, depends upon electro-magnetic induction. It will be discussed under that heading.

## IV. LAWS AND SIMPLE PHENOMENA OF "DIRECT" ELECTRIC CURRENTS:

A. **Direct and Alternating Currents Distinguished:** A current may flow steadily in one direction, as it does from a voltaic cell, or it may reverse direction periodically, as in the case of a condenser discharge. The first type is a **direct current (D.C.)** and the second is an **alternating current (A.C.)** Since alternating currents are created by electromagnetic induction, we shall discuss direct currents only at this point.

B. **Attributes of a Direct Current: 1116, 1110.** The characteristics of a direct current are determined by the following elements: the **quantity** of electrons moving, or volume of current (symbol **I**), measured in **amperes;** the **pressure** which drives the current (symbol **E**), measured in **volts;** and the **resistance** which the current encounters (symbol **R**,) measured in **ohms.** The pressure is the same as the "potential difference" between the terminals of the generating unit supplying the current. It is usually called the **electromotive force (E.M.F.).** The power of the current depends upon both the quantity of current and the pressure under which it flows, and is measured in **watts** (1116). The various units are so chosen that the watt of electrical power will be the same as the watt of mechanical power. A **coulomb** is the quantity of electricity delivered in one second by a current of one ampere.

B. **Ohm's Law:** The relation between potential, current, and resistance is expressed by Ohm's Law (1120). In symbols it is as follows: $I=\frac{E}{R}$, in which **I** is expressed in amperes, **E** in volts, and **R** in ohms.

C. **Divided Currents:** Series and Parallel Connections. When current passes through one element after another in a circuit—as when it passes through a bank of lamps, or a series of dry cells—the elements are said to be connected in **series.** When branches divide the circuit and send a part of the current through each element, the elements are connected in **parallel.**

D. **Measurement of Current:** Electric currents are measured by means of instruments called Galvanometers (1392, 1113). Those which measure amperes are called Ammeters, and those which measure volts are called Voltmeters.

V. **NATURE OF MAGNETISM:** The Molecular Theory of Magnetism (2122) explains the properties of magnets as being due to the symmetric arrangement of molecules within the magnetic body. But we do not yet know what makes the molecule of certain substances magnetic.

A. **Polarity:** The "north-and-south pole" phenomenon in magnets is explained on page 2122, and in the article on the Compass (853). The Compass article also explains the difference between magnetic variation and deviation.

B. **Magnetic Dip:** A Magnetic needle so mounted as to move freely in all directions will be found, if observed anywhere but on the magnetic equator or "aclinic" line, to dip at one end. The angle which it makes with a horizontal plane is called the **inclination** of the needle or **magnetic dip.** At the magnetic pole the dip is 90 degrees. That is, the needle stands straight on end.

C. **Magnetic Substances and Magnetic Penetration:** Substances which can be attracted or magnetized are called magnetic. The only important ones besides iron and steel are nickel and cobalt. Magnetic force acts freely through all non-magnetic substances, but is "screened" by sheets of magnetic substances.

D. **Lines and Fields of Magnetic Force:** Magnetic force seems to act along lines called **lines of force,** flowing out from the north pole and into the south pole. These lines can be traced by placing a glass plate over a magnet and dusting iron filings upon it (2123 picture). The filings will arrange themselves along the "lines." Since magnetism seems to act thus along definite lines, physicists always use these lines as a means of picturing magnetic conditions in an area. A **magnetic field** is therefore the complete group of lines depicting magnetic conditions in a given area.

VI. **ELECTROMAGNETIC INDUCTION:** The fact that electricity and magnetism are related phenomena was discovered when Oersted found that an electric current had magnetic effects (1121), and Faraday found that a magnetic field generated electric currents (1224, 1050, 1051 picture).

A. **Magnetic Field of a Current:** When direct current passes through a straight wire, a magnetic field is created. In any plane cutting squarely across the wire the lines of force are formed as concentric circles with the wire as a center.

a. **Determining Direction of the Lines of Force:** Grasp the wire with the right hand, with the thumb pointing in the direction the current flows. The fingers will then point in the direction in which the force along the magnetic lines is exerted.

b. **Magnetic Field Around a Coil:** If a wire carrying a current is bent into a loop, all the lines of force enter the loop at one face and come out at the other face. If several loops are put together to form a coil, practically all the lines of force will pass around the outside and through the center of the coil, as if it were a single wire. Such an arrangement is known as a solenoid. If an iron core be placed within the loops of the coil, the power is greatly increased, and the device is known as an electromagnet (2122).

1. The strength of an electromagnet depends upon the strength of the current and the number of loops or turns of wire which form the coil.
2. To determine the polarity of an electromagnet, grasp the coil with the right hand, so that the fingers point in the direction of the current in the coil. The thumb will then point to the north pole of the coil.

B. **Induction of Current by a Magnetic Field:** Faraday found that when lines of magnetic force move across a conductor, or when a conductor moves across lines of magnetic force, a current is set up or induced in the conductor. It is this discovery which makes it possible to turn mechanical energy directly into electrical energy by such devices as the dynamo (1050).

C. **Character of Induced Currents:** Current is induced under the circumstances described above only when the conductor is **moving** in the magnetic field, and the strength of the induced E.M.F. varies directly as the speed of the moving conductor. Of course, if it is the magnetic field which moves and the conductor which remains stationary, the effect is the same. If the conductor be a coil of many turns of wire and if the magnetic field be created by an electromagnet, the current is naturally much stronger.

a. **Direction of Induced Currents:** Any induced current has such a direction that the magnetic action it sets up after it starts tends to resist or oppose the motion which produces it.

b. **Three-Finger Rule:** In order to discover readily the direction of an induced current in a wire, point the index finger of the right hand straight ahead, the thumb to the left, and the middle finger down; now set the index finger in the direction in which the lines of magnetic force are acting, and thumb in the direction in which the wire is moving with respect to the lines of force; the middle finger will then point in the direction of the induced current.

D. **Currents Induced by Other Currents:** We may consider that the currents induced by the above methods are due simply to a **change** in the lines of magnetic force with respect to the conductor. A similar change may be produced in the field of an electromagnet by altering the intensity of the current which flows through it and produces the field. If the current be rapidly turned on and off, for instance, it will set up an induced current in any conductor which lies across the lines of force. It is upon this principle that the **induction coil** operates.

E. **Alternating Currents:** Currents produced by altering the intensity of primary currents are of the type called **alternating,** that is they flow first in one direction then in the opposite direction. The reason for this will be apparent when we consider that the cause of the induced current is the "expansion" and

"contraction," so to speak, of the lines of force in the field of the primary, as the current alternately waxes and wanes. We saw above how the direction of motion across the lines of force affected the direction of the induced current. In this light, the "expansion" and "contraction" of the lines of force across the secondary conductor has exactly the same effect as a constantly repeated change of direction of motion.

# Chemistry

I. **CHEMICAL VIEW OF MATTER:** The problem of what matter really is, belongs to the physicist. The chemist uses a special viewpoint suited to his particular studies. We can best get this viewpoint by seeing how the chemist views substances such as iron, iron-rust, and table salt.

A. **Pure Substances:** All specimens of pure iron show the same set of properties—gray color, hardness, etc. All specimens of iron-rust show a different set, peculiar to rust. Table salt shows still another set of properties. The chemist calls any definite kind of matter, whose specimens all show the same properties, a **substance.** Iron therefore is one substance, rust another, and table salt still another, because each one exhibits peculiar and **invariable** properties.

a. **Physical State:** A substance may be either solid, liquid, or gaseous.

b. **Crystalline and Amorphous Substances: 935.** If the particles of a solid substance have a definite and invariable form, the substance is **crystalline.** If the particles show no definite form, the substance is **amorphous** (meaning "without form").

B. **Mixed Substances:** It is perfectly possible to mix substances, and produce mixtures of fairly definite, **but not invariable,** properties. The component substances do not lose their identity and may be recovered by mechanical means from the mixture (711). A mixture of iron with table salt or with sulphur (712) is an example. The ingredients of a mixture are called **components** because they are simply placed together, without change, and can be separated without change. No one of the components affects any other component or alters any of its properties.

C. **Dissolved Substance and Solutions:** Many substances, such as iron in the form of filings, can be shaken up in liquid substances, such as water, without undergoing immediate change. Other substances such as salt, when mixed with water, promptly disappear or **dissolve.** They are recoverable, however, apparently unchanged, by mechanical means such as evaporation. When a solid disappears in a liquid, but without apparent change of its inherent properties, it is said to be **in solution.** The substance so dissolved is called the **solute,** and the liquid is called the **solvent.** The combination is a **solution.** If particles of a finely divided substance be shaken up in a liquid, but gradually settle out, the mixture is not a solution but a mere **suspension.** In a solution, the dissolved substance remains invisible and in solution.

D. **Disappearance of Substances and the Idea of Compounds:** While iron filings will disappear in time when placed in water, they do not dissolve, as salt does. They change to **iron-rust,** a substance entirely different from iron. The change is not a mere mixture; it is not a solution; it is a **genuine transformation of substance.**

— **Formation of Compounds:** Suppose we examine this rusting more closely by moistening the interior of a glass tube closed at one end, sprinkle some powdered iron upon the interior surface, and set the tube mouth downwards in a dish of water. As the moist iron slowly rusts, the water pushes farther up into the tube. Evidently part of the air has been absorbed and the water has been forced up to take its place. Apparently, then, this lost air or some part of it has **combined** with the iron to make rust (3099). Portions of two substances have **disappeared** and in their places **we have a new substance.** Such a union, in which the constituent substances have lost their identity, is called a **compound.**

E. **The Field of Chemistry:** The examination of such transformations in substance and the conditions under which they occur, constitutes the field of chemistry.

II. **ELEMENTS:** Countless experiments in the past and present have broken up many substances into constituent substances, and combined many substances to form others. In all these experiments, however, certain substances such as Iron, Copper, and Sulphur, stand out as unbreakable. They can be combined into other substances, but they can never be broken up into other substances. Any substance which appears to be irreducible is called an **element** (710–711).

III. **COMBINATION OF ELEMENTS INTO COMPOUNDS:**

A. **Law of Combining Weights:** When we turn iron into rust as described above, only one-fifth of the air is used. This behavior indicates that whatever comes from the air to make rust forms one-fifth of the air's volume. Air therefore must be a mixture or compound, of which the "rusting substance" forms one-fifth by volume. Also, in any given case of rusting we find that for a certain consumption of the "rusting substance" in air, an invariable weight of iron changes to rust, and any excess of metal remains unrusted. If we weigh the amount of "rusting substance" consumed we find that the "rusting substance" (which we know to be the gas **Oxygen**) and iron always combine in the following proportions by weight: Oxygen (16): Iron (55.84). By experimenting with many elements in all sorts of combinations, we learn that every element has a certain combining ratio by weight with any element it joins to form a compound. From this we get the law of definite or constant proportions: **In every sample of any compound substance formed or decomposed, the proportion by weight of the constituent elements is always the same.** This characteristic weight is the combining weight of the element in that compound.

B. **Law of Multiple Proportions:** If we experiment with various elements we discover the following: While any given element may have different combining weights in the different combinations it enters, **the higher**

**combining weights are always multiples of the lowest one obtained.** This is the so-called "Law of Multiple Proportions."

C. **The Atomic Theory:** From these various phenomena, chemists long ago built up the atomic theory. This theory says that any given element is composed of minute, invisible particles, which are all alike in weight, and that the weight of the particle of that element is different from that of the particle of any other element. Such particles are called **atoms** (714). Since we cannot see any such particles, we must suppose them exceedingly small. If then we suppose that compounds are formed by union between the atoms of the elements concerned, the phenomena of "combining weights" and of "multiple proportion" become clear. If, for example, two elements combine atom for atom, it does not matter what quantities of the two elements be used; the total weight of each element entering into the compound will be in the same ratio as the weights of the two kinds of particles. If the combining weight of an element in one compound is twice as great as in another compound, we need only say that two atoms of the element have entered into one compound while only one atom entered into the other.

a. **Molecules:** When atoms of two or more different elements unite to form a compound, the smallest possible particle of this compound is called a **molecule** (714). When the atoms of an element are unmixed with those of another, and thus give us a pure element, such as we have in a piece of iron, the atoms usually combine in pairs. These are known as **molecules of the element.**

b. **Electrons:** As explained in the article on Atoms and Electrons (256), physicists now have shown that the atoms of elements are not indivisible, as formerly supposed, but really consist of **electrons** in various combinations. Since in all ordinary chemical work, however, the atoms remain indivisible, we may still say that **atoms are indivisible so far as practical chemistry is concerned.**

D. **Atomic Weights:** If we assign an arbitrary number to express the weight of one atom of an element, we can express the comparative weight of an atom of any other element in terms of the element chosen as a standard. Such a method gives us the so-called **atomic weights** of the elements. Formerly, chemists used the lightest element, the gas **Hydrogen,** with a value of **1,** as the standard. Now **Oxygen,** with a value of **16,** is used, both because its greater variety of activity permits more combinations to be made with it, thus making comparison of combining weights easy, and because it gives more atomic weights of the other elements in whole numbers. The atomic weights of the known elements are given on page 4042.

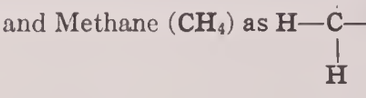
E. **Chemical Symbols for Elements and Simple Compounds:** In order to write out their data quickly, chemists have invented the following "shorthand" system:

a. **For Elements:** Every element is assigned an initial, as **H** for Hydrogen, **C** for Carbon, etc. When two or more elements would have the same initial letters under this system, another letter is added to the initial to distinguish them, as **Ca** for Calcium, **Cl** for Chlorine. The symbol is frequently based on the Latin name, as **Fe** for Iron (*ferrum*) and **Pb** for Lead (*plumbum*), or on the name in some other foreign language. The symbols are chosen by international agreement and the same symbols are used throughout the world by chemists.

b. **Formulae and Simple Chemical Equations:** The composition of simple compounds can be stated by setting down the necessary symbols for the elements, and the result is a **formula.** For example, **Ferrous Sulphide** (712) may be indicated in symbols as **FeS** (**Fe** for Iron, and **S** for Sulphur). A mere mixture of Iron and Sulphur (712) is shown by the plus sign, thus: **Fe** + **S** (715–6). When the mixture is fused into Ferrous Sulphide by heat (712), we indicate the change by an arrow, thus: **Fe** + **S** $\rightarrow$ **FeS.** Such an array of symbols, showing a transformation, is called a **chemical equation.** When only a single atom of an element is used in forming a compound, the symbol for that element is given without qualification (as **Fe** or **S** in this case). But when more than one atom of an element is present in a compound, we indicate it by a small number placed at the lower right hand corner of the symbol, as $H_2O$, meaning that **two** atoms of Hydrogen have combined with **one** atom of Oxygen. When more than one molecule is concerned in an equation, we put the number in front of the symbols describing the molecule. Thus two molecules of water is written $2H_2O$.

F. **Valence:** It has been found that the atoms of different elements possess in varying degrees the power of combining with atoms of other elements. Thus an atom of Hydrogen or an atom of Chlorine can never seize and combine with more than **one** atom of any other element. One atom of Oxygen, however, can seize and combine with **two** atoms of another element, while one atom of Carbon can seize and combine with **four** atoms of another element, and so on. This "capacity for combination" in an element is known as its valence. If we regard an atom as combining by means of hands, and we say that a chemical union is forming by clasping hands, one from each of the elements combined, we see that Hydrogen and Chlorine, have only one "hand" each, that is, they have a **valence** of one; Oxygen has two hands, or a **valence of two;** and Carbon has four hands or a **valence of four.** In the combination of Carbon and Oxygen to form Carbon Dioxide ($CO_2$), the four hands of the carbon may be regarded as clasping the two hands extended by each of the two Oxygen atoms.

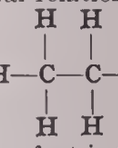
a. **Representing Valence:** The usual way of representing valence in chemical formulae is by means of lines, thus: **H**—, —**O**—, =**C**= or —**C**(—)—. Hydrochloric Acid (**HCl**) on this system of using lines, would be pictured as **H—Cl,** Water ($H_2O$) as **H—O—H,** and Methane ($CH_4$) as



b. **Each Element Combined Must Contribute a Valence:** An atom of Chlorine, for instance, cannot seize upon an atom of Hydrogen while the Hydrogen is united to Oxygen. The Hydrogen must first be disengaged in order that it may contribute its valence to the union—that it may "clasp hands," so to speak, with the chlorine.

c. **Valence toward Hydrogen and Oxygen:** Experience has shown that many elements have one valence toward Hydrogen and elements resembling Hydrogen, while they have another valence toward Oxygen and elements resembling it. Thus, Nitrogen usually exhibits a valence of three (III) toward Hydrogen and towards such elements as Chlorine, which resemble Hydrogen chemically; but toward Oxygen, Nitrogen often exhibits a valence of five (V).

G. **Empirical and Structural Formulas:** We have seen that a compound may be written by using the chemical symbols and little numbers. Thus, grain alcohol can be shown as $C_2H_6O$, since one molecule contains atoms in the proportions shown. Such a formula is called an **empirical formula.** But by using the line-system of exhibiting valence, we can express formulae in a way that shows the chemical relation of the atoms to each other within the molecule. On this system, grain alcohol would be



A formula written in this manner is called **graphic.** A shorter way of exhibiting the same fact is to write grain alcohol thus: $C_2H_5OH$. This style is known as a **rational formula.** Both graphic and rational formulas are classed as **structural.**

H. **Radicals:** We know that Sulphuric Acid is composed as follows: $H_2SO_4$. When it combines with, say, Potassium, we get so-called Potassium Sulphate, $K_2SO_4$. With Copper we get $CuSO_4$, and so on—the $SO_4$ always being present. Such a group, persisting characteristically throughout a set of related phenomena is called a **radical.** In this case, $SO_4$ is the radical of Sulphuric Acid; and this acid forms **salts** combining its radical with other elements in proportion to their "hydrogen valences." Another radical is hydrox (**OH**) which unites with an atom of Hydrogen to form Water, an atom of Sodium to form Sodium Hydroxide (**NaOH**) or caustic soda, and so on. Grain alcohol, as described above, is a combination of two radicals—the "ethyl" radical, or $C_2H_5$, and **OH**. If instead of the "ethyl" radical we have methyl ($CH_3$), the result is **methyl** or "wood" alcohol.

## NATURE AND TYPICAL PHENOMENA OF CHEMICAL ACTION

### I. ELECTRICAL NATURE OF CHEMICAL AFFINITY:

A. **Structure of the Atom:** Within the last two decades, physics has developed the idea that matter is composed of electrons (256). In detail, the new theory claims that any atom consists of (1) a central nucleus bearing a charge of positive electricity, and (2) one or more negative electrons circling planet-like about the central nucleus, their combined charges being sufficient to balance the positive charge on the nucleus. According to this theory, the atoms of different elements differ from each other only in the mass of the central nucleus and the amount of electricity borne by it, and the number of negative electrons present.

B. **Affinities between Atoms:** The addition or loss of a negative electron upsets the normal balance within the atom, and gives it an electric charge (See Physics Outline). This charge attracts charges of unlike nature borne by other "unbalanced" atoms, thereby creating the attraction between atoms which we call "chemical affinity."

C. **Structure of the Radioactive Atom:** In atoms of elements such as Radium (2959), the lack of balance between the positive and negative portions of the atom is so great that the atom expels from within itself a positive or negative particle, and regroups the remaining atoms into a stable system. Expelled positive particles are called **alpha** particles (2960); expelled negative particles are called **beta** particles (2960); so-called **gamma** rays (2960) are electromagnetic waves of exceedingly short length set up by the disturbance within the atom. The atom resulting from this "internal explosion" is a definite chemical element different from Radium. After passing through several stages of disintegration, each one constituting an element called a "radium emanation," Radium eventually attains a stable form as Lead (2959).

### II. BASIC PHENOMENA OF CHEMICAL AFFINITY:

A. **Types of Chemical Action:**

a. **Combination:** When elements or radicals unite, we have a case of **chemical combination.**

b. **Decomposition:** When a compound breaks up into its constituent elements or radicals we have **chemical decomposition.**

c. **Substitution:** When two compounds exchange their constituent parts, we have a case of **substitution** or **displacement.**

d. **Catalysis:** Many elements and radicals which will not combine of themselves, do so readily in the presence of certain substances, which apparently do not themselves enter into combination. The presence of spongy platinum, for example, unites oxygen and hydrogen (2831). Substances which do this are called **catalysts.**

### III. EFFECT OF SOLUTION UPON CHEMICAL AFFINITY:

A. **Physical Properties of Solutions:** A dissolved substance is believed to disappear in a solution because its particles break up into their constitutent molecules, and the molecules diffuse, or become dispersed, among the molecules of the liquid. The degree to which a substance will disappear in this way is called its **solubility.**

a. **Concentration:** The proportion of dissolved molecules to the molecules of the liquid is called the **concentration** of the solution. A **dilute** solution is one with small concentration.

b. **Saturated Solutions:** When once dissolved, the molecules of the solute wander about and from time to time encounter each other. When this happens they tend to resume their solid form. Obviously, the more molecules dissolved, the greater will be this tendency; and at a certain point the tendency to solidify again equals the dissolving tendency of the liquid. Then no more molecules can pass into solution, and the liquid is said to be **saturated.** Since heat increases molecular activity, it increases the tendency of molecules to separate. This reinforces the natural dissolving tendency. Therefore heating a liquid raises its **saturation point.**

c. **Diffusion:** The tendency of all dissolved substances is to diffuse within the solution until the concentration of the latter is the same at all points. This phenomenon gives rise to "diffusion pressure" or "osmatic pressure" (2825–6) in solutions.

B. **Dissociation:** When compound substances are dissolved in water, the bonds uniting the constituent elements or radicals are weakened, and the compound tends to fall apart into electrically charged portions called **ions.** This "falling apart" is called **dissociation.** Substances other than acids, bases, and salts will not ionize when dissolved in water.

IV. **CHEMICAL AFFINITY AND ELECTRIC FORCE:** The theory concerning the electrical structure of the atom naturally suggests that any given chemical element may display one of three different types of electrical affinity. If the atom is practically balanced electrically, we expect to find it with practically no affinity, or tendency to combine. This would explain those elements which are **inert,** or inactive chemically. The active elements we might expect to find divided into the **electropositive** group and the **electronegative** group, subject, of course, to the condition that an atom may be so unstable as to have both positive and negative affinities, and be only predominantly one or the other. That is, a given kind of atom might have a greater average positive charge, but a strong positive charge on a neighboring atom might bring its negative charge into play. Although scientists suspect that all chemical affinity is really electrical, the most clean-cut case, and the only one they have worked out adequately, is in the case of substances which ionize in solution. The phenomena may be divided into two classes: (**1**) Those where electric current is created; and (**2**) those which are caused by electric current. In either case, the substance in solution is called the **electrolyte** and the conducting wires which lead away the current created or introduce the current which causes the phenomena are called **electrodes.**

A. **Creation of Electric Current:** As we have seen, substances which dissociate when placed in solution break up into ions with positive and negative charges. To take a simple case, Sulphuric Acid ($H_2SO_4$) breaks up into Hydrogen-ions, with a positive charge and Acid-Radical-ions with negative charge ($SO_4$). Suppose now that rods of Copper and Zinc are inserted in the solution. What happens? The $SO_4$ ion has a greater affinity for Zinc than for Copper. It therefore detaches particles from the Zinc plate, and unites them to itself to form Zinc Sulphate ($ZnSO_4$). Since the Zinc atom must lose a negative electron in order to acquire the positive charge needed for the union, it follows that the Zinc plate rapidly becomes filled with free negative electrons. That is, it acquires a "negative charge." In the meantime, the hydrogen atoms in their wanderings have encountered the copper plate. If there be a connecting wire between the zinc and copper plates, the negative electrons at once rush through it in response to the attraction of the positive charge born by the hydrogen-ions. This flow constitutes an **electric current** and is explained by the picture on page 1109.

B. **Phenomena Caused by Electric Current—Electrolysis:** When the above process is reversed—that is, when current is supplied to a solution, rather than created by it—we have the phenomena known as **Electrolysis** (1125).

C. **Electromotive Series:** The following series of metals with Hydrogen are arranged in such order that any member of the series tends to displace any of those listed after it from union with oxygen and electronegative acid radicals: **Potassium, Sodium, Calcium, Magnesium, Aluminum, Manganese, Zinc, Chromium, Iron, Nickel, Tin, Lead, Hydrogen, Copper, Bismuth, Antimony, Mercury, Silver, Platinum, Gold.** In electrolysis the electromotive force of the current required to deposit each metal is less than that for the metal preceding it.

## GENERAL PROPERTIES OF ELEMENTS

I. **FAMILIES OF ELEMENTS:** Experiments show that many elements can be placed together in groups called families, all members of the group having similar properties. The most conspicuous example is the **halogen family** (755), with Fluorine, Chlorine, Bromine, and Iodine. Another example are the **inert gases** (50), Helium, Neon, Argon, etc.

II. **PERIODIC LAW:** The existence of families and similar evidences of allied behavior long ago convinced chemists that there must be some simple way of arranging elements so that related groups would fall into order. The most obvious plan was to arrange them according to atomic weight, and in 1869 Mendeleeff, by leaving hydrogen out of account, succeeded in producing the so-called **periodic system** of elements. The table found on the next page shows them arrayed in the latest form of this system. You will also notice several gaps in the table. These were left in order to bring the elements following into their proper chemical relations. That this procedure is valid may be seen from the fact that Mendeleeff's original table had many more gaps, left for the same reason, and that as elements were discovered since his time, **they were invariably found to fit gaps in his scheme.** These gaps therefore represent elements still unknown.

III. **BINARY COMPOUNDS:** Many unions of two elements, which do not form either acids or salts, and which are

# TABLE OF ELEMENTS ACCORDING TO THE PERIODIC SYSTEM

In the table, the name of each Element is printed in bold-face type, thus: **Hydrogen**. The chemical symbol follows immediately after, in parentheses, thus: **(H)**. The Atomic Weight is printed in bold-face figures, thus: **1.008**. The Specific Gravity is printed in italic figures, thus: *.061*. Where the specific gravity is marked with a dagger (†) it is the specific gravity as compared with Air. The mark § for Carbon indicates that the specific gravity given is that of carbon when in diamond form. Where no specific gravity is shown, it is unknown or not satisfactorily determined. Notice that the first two horizontal rows contain roman numerals and are marked **H** and **O** at the extreme left hand end. Those roman numerals indicate the usual valence of the elements beneath them for Hydrogen and Oxygen respectively. When the valence is variable, the fact is indicated by a star (*). The element **Glucinum** is sometimes called **Beryllium (Be)**.

**HYDROGEN (H) 1.008** *.061*

| H | O | I | II | III | IV | III | II | I | O |
|---|---|---|---|---|---|---|---|---|---|
| O | O | I | II | III | IV | V | VI | VII | VIII or Variable |
| | Helium (He) 4 *.1367†* | Lithium (Li) 6.94 *.585* | Glucinum (Gl) 9.1 *1.93* | Boron (B) 10.9 *2.5* | Carbon (C) 12 *3.52§* | Nitrogen (N*) 14.01 *.967†* | Oxygen (O) 16 *1.105†* | Fluorine (F) 19 *1.265†* | |
| | Neon (Ne) 20.2 *.688†* | Sodium (Na) 23 *.978* | Magnesium(Mg) 24.32 *1.74* | Aluminum (Al) 27.1 *2.58* | Silicon (Si*) 28.3 *2.0–2.4* | Phosphorus(P)* 31.04 *1.8–2.3* | Sulphur (S*) 32.06 *2.07* | Chlorine (Cl) 35.46 *2.488†* | |
| | Argon (A) 39.88 *1.378†* | Potassium (K) 39.1 *.87* | Calcium (Ca) 40.07 *1.58* | Scandium (Sc) 44.1 .... | Titanium (Ti) 48.1 *3.54* | Vanadium (V*) 51.06 *5.5* | Chromium (Cr) 52 *6.5* | Manganese(Mn) 54.93 *7.39* | Iron (Fe*) 55.85 *7.86*<br>Cobalt (Co*) 58.97 *8.6*<br>Nickel (Ni*) 58.68 *8.9* |
| | | Copper (Cu) 63.57 *8.9* | Zinc (Zn) 65.37 *7.12* | Gallium (Ga) 69.9 *5.95* | Germanium (Ge) 72.5 *5.47* | Arsenic (As) 74.96 *5.73* | Selenium (Se) 79.2 *4.5* | Bromine (Br) 79.92 *3.15†* | |
| | Krypton (Kr) 82.92 *2.82†* | Rubidium (Rb) 85.45 *1.52* | Strontium (Sr) 87.83 *2.54* | Yttrium (Yt) 88.7 *3.8* | Zirconium (Zr) 90.6 *4.15* | Columbium (Cb) 93.5 *12.7* | Molybdenum(Mo 96 *8.6* | ..... | Ruthenium(Ru* 101.7 *12.26*<br>Rhodium (Rh) 102.9 *12.1*<br>Palladium (Pd*) 106.7 *11.4* |
| | | Silver (Ag) 107.88 *10.5* | Cadmium (Cd) 112.4 *8.64* | Indium (In) 114.8 *7.4* | Tin (Sn) 118.7 *7.3* | Antimony (Sb) 120.2 *6.62* | Tellurium (Te) 127.5 *6.0* | Iodine (I) 126.92 *4.95* | |
| | Xenon (Xe) 130.2 *4.42†* | Caesium (Cs) 132.81 *1.88* | Barium (Ba) 137.37 *3.75* | Lanthanum(La) 139 *6.1* | Cerium (Ce) 140.25 *6.68*<br>See Note below for other elements of this group. | Tantalum (Ta) 181.5 *10.4* | Tungsten (W) 184 *19.1* | ..... | Osmium (Os*) 190.9 *22.48*<br>Iridium (Ir) 193.1 *22.4*<br>Platinum (Pt*) 195.2 *21.5* |
| | | Gold (Au) 197.2 *19.3* | Mercury (Hg) 200.6 *13.596* | Thallium (Tl) 204 *11.85* | Lead (Pb) 207.2 *11.37* | Bismuth (Bi) 208 *9.8* | | | |
| | Niton (Nt) (Radio element) 22.2 .... | ..... | Radium (Ra) 226 .... | | Thorium (Th) 232.15 *11.00* | | Uranium (U) 238.2 *18.7* | | |

Note: Grouped with Cerium are the following "rare earth" elements: Praseodymium (Pr) **140.6,** *6.48;* Neodymium (Nd) **144.3,** *6.96;* a gap, to be filled by some undiscovered element; Samarium (Sa) **150.4,** *7.7;* Europium (Eu) **152;** Gadolinium (Gd) **157.3;** Terbium (Tb) **159.2;** Dysprosium (Dy) **162.5;** Holmium (Ho) **163.5;** Erbium (Er) **167.7;** Thulium (Tm) **168.5;** Ytterbium (Yb) **173.5;** Lutecium (Lu) **175.**

*For additional information on topics mentioned in these Outlines*

usually insoluble, are known as **binary compounds.** The compound is usually named for the two elements, with the name of the metallic element first, having the ending **-ic** or **-ous,** with the other name ending usually in **-ide.** If the elements can combine in different proportions, the **-ic** ending is used for the compound containing the smaller proportion of the metallic element. Examples: Ferric sulphide ($Fe_2S_3$) and Ferrous Sulphide (**FeS**).

IV. **ACIDS: 8.** Long before much was known of chemistry, people recognized an affinity between certain substances, sour in taste, and generally destructive of metal, known as **acids.** Chemistry recognizes this grouping as valid, and adds that an acid is a compound of Hydrogen with an electronegative element or radical. Common acids are: **Sulphuric** (3390), **Nitric** (2510), **Hydrochloric** or **Muriatic** (1710, 755) **Carbonic** (642, 571), **Boric** or **Boracic** (151, 464), **Hydrocyanic or Prussic** (944, 2855), **Picric** (641, 1212), **Silicic** (3234).

A. **Solubility:** Acids are generally soluble and dissociate in solution.

B. **Tests for Acids:** The commonest tests consist of introducing substances which change color in the presence of acid. The most frequent test is made with **litmus** (10).

V. **BASES: 10.** A base is a compound formed with the hydroxyl radical (**OH**). Solutions of such compounds have a soapy feeling and a bitter taste, and give reactions opposite to those of acids when subjected to the litmus test. Since the hydroxyl radical is electronegative, it tends to unite with electropositive elements, called the **base-forming elements.** Among these base-forming elements are the following: the Metals (2201); the Alkali Metals, Lithium, Sodium (3271), Potassium (2898), Rubidium, Caesium; the Alkaline Earths Calcium (571), Barium (1472, 2776, 2642), Strontium.

A. **In General, Bases are Soluble and Dissociate in Solution.**

B. **Phenolpthalein Test:** Phenolpthalein ($C_{20}H_{14}O_4$) is a complex organic compound with feeble acid properties. When in solution it does not react to acids, but turns red in the presence of a base.

C. **Alkalies: 8.** An alkali is simply a base formed with one of the alkali metals or the radical Ammonium ($NH_4$). Note that ammonium is not the same as Ammonia ($NH_3$).

VI. **SALTS: 10.** We have seen that both an acid and a base consist of an electronegative radical, combined with an electropositive element or radical. A salt has the same structure, save that the electropositive element **cannot be hydrogen,** and the electronegative radical **cannot be hydroxyl.**

A. **Behavior:** Salts dissolve in water and dissociate. They do not react to any of the tests for acids or bases; that is, a salt solution will not turn red litmus blue or blue litmus red. For this reason they are called **neutral.**

B. **Formation by Reaction between Acids and Bases:** Salts are commonly formed by placing an acid and a base together. When this is done, and exchange of electropositive elements takes place, the Hydrogen of the acid unites with the hydroxyl of the base to form water, and the electropositive element or radical of the base unites with the acid radical to form a salt.

C. **Formation by Reaction between Acids and Metallic Elements:** A metal and an acid react to form a salt, if the metal stands higher in the Electromotive Series (see above) than Hydrogen. On the other hand, a combination of free Hydrogen and a salt forms acid and a free metal, if the metal stands below Hydrogen in the Electromotive series.

E. **Acid and Basic Salts:** If either the electropositive or electronegative fraction of a salt has more than one valence, and the salt-making process is completed for every valence, we get a complete or **neutral** salt. Sodium Sulphate ($Na_2SO_4$) and Calcium Chloride ($Ca_2Cl$) are examples. If the process is incomplete, we get "half-way" salts as follows: (a) If an acid radical has more than one valence, and all of the hydrogen is not displaced, we get an **acid salt,** with an acid reaction to litmus and some of the properties of a salt. Acid Sodium Sulphate ($NaHSO_4$) is an example; (b) If an element with more than one valence has been combined with hydroxyl radicals, and all the hydroxyl is not displaced, we get a **basic salt,** with a basic reaction to litmus and some of the properties of a salt. Basic Calcium Chloride (**CaOHCl**) is an example.

F. **Mixed and Double Salts:** When the salt formation is complete, but more than one element or type of radical has displaced the Hydrogen or hydroxyl, we have a **mixed salt.** Sodium-Potassium Carbonate ($NaKCO_3$) is an example. When two or more salts are chemically united, we have a **double salt.**

## CHEMISTRY OF CARBON COMPOUNDS

**FIELD COVERED:** This branch of chemistry is often called **Organic Chemistry,** because at one time it was supposed that only living organisms could produce the substances studied.

A. **Nature of Organic Compounds:** Organic compounds consist typically of various radicals, arranged in different combinations, but all containing carbon. Hence it is important to know: (**1**) the principal radicals; and (**2**) the principal combining types.

B. **Important Radicals:**

a. **Hydro-Carbons:** Radicals containing Carbon and Hydrogen only.

**1. Open-chain, Saturated, or Paraffin Series:** In these radicals, Carbon atoms are united in a line or "open chain," thus: —C-C— . . . , with Hydrogen grouped about the edge. Important members: Methane ($CH_4$), Ethane ($C_2H_6$), Propane ($C_3H_8$), Butane ($C_4H_{10}$), Pentane ($C_5H_{12}$). This group is often called the paraffin series because many of its members are found in paraffin. The type formula of this group is $C_nH_{2n+2}$, which means that the number of Hydrogen atoms is equal to twice the number of Carbon atoms plus two. The names of the radicals end in **-ane.** When a Hydrogen atom is removed, in order to permit entering into combination, the ending changes to **-yl.** Examples: Methane, $CH_4$, Methyl, $CH_3$.

2. **Ethylene Series:** These radicals have certain carbon valences unsatisfied, and are of the type: $C_nH_{2n}$. Example: Ethylene ($C_2H_4$), a constituent of illuminating gas.
3. **Acetylene Series:** Type formula: $C_nH_{2n-2}$. Example: Acetylene, $C_2H_2$.
4. **Benzene Series, "Closed Chain," or Aromatic Series:** This is an exceedingly important series, in which the carbon atoms are linked in one or more closed rings. Type formula: $C_nH_{2n-6}$.

b. **Carbohydrates:** Carbohydrates are radicals containing Carbon, Hydrogen, and Water, the latter in the proportion of 2 to 1. On treatment with dilute acid, they all become monosaccharide sugar. Only a few of the most important can be mentioned:
1. **Monosaccharides: 3388.** These are compounds of the type $C_6H_{12}O_6$, differing chiefly in optical and complex chemical properties (2000). Examples: Glucose (1475); Fructose (3388).
2. **Disaccharides:** These consist of two monosaccharide molecules, less the equivalent of a water molecule, in combination. Typical formula: $C_{12}H_{22}O_{11}$. Examples: Sucrose or Cane Sugar (3388–9), Maltose (3388), Lactose (3388).
3. **Polysaccharides:** Contain more than two monosaccharide molecules, less the equivalent of some water, in combination. Typical formula: $(C_5H_{10}O_5)$. Examples: Starch (3344) and Cellulose (673).

C. **Substitution Compounds:** These are formed by substituting elements or radicals for Hydrogen atoms in organic and a few inorganic radicals. Only a few of the enormous number can be given as examples:
a. **In Open-Chain Radicals.** Two important substitution compounds of Methane ($CH_4$) are: **Chloroform,** $CHCl_3$ (three atoms of Chlorine displacing three of Hydrogen), and Iodoform, $CHI_3$.
b. **In Benzene Radicals:** Substitution of one Hydroxyl Molecule (**OH**) in the Benzene ring ($C_6H_6$) gives Carbolic Acid, $C_6H_5OH$ (641), which is not a true acid. Substitution of Methyl ($CH_3$) gives Toluene ($C_6H_5CH_3$). Substitution of nitro groups ($NO_2$) gives various high explosives, T.N.T., or **Tri-Nitro-Toluene,** being an example.

D. **Substitution Compounds in Ammonia ($NH_3$):**
a. **Amines:** These are formed by substituting one or more organic radicals for the Hydrogen atoms of Ammonia. They are called amines, di-amines, or tri-amines according to the number of **H** molecules displaced. Example: Methyl Amine ($CH_3$) $NH_2$.
b. **Amides:** These are similar to amines, save that the substituted radical must be an **organic acid.**

**COLLOIDS AND THE COLLOIDAL STATE:** In the first part of the Outline we divided solid matter into crystalline and amorphous forms, and said that when the solids are placed in a solute, they either remain in suspension or dissolve. There is one important exception to this rule, namely, the substances known as **Colloids.**

A. **Colloidal Suspension and Solutions:** In a **suspension,** the particles of insoluble substances remain unchanged in their crystalline or amorphous form, and are kept from settling at once only by the impact of the moving molecules which make up the solvent. In a **solution,** the particles break up into individual molecules, and these, being practically as light as the molecules of the solvent, remain suspended indefinitely. There is, however, an intermediate state known as **colloidal suspension,** taken by various kinds of substances, usually those with high molecular weight. In this state the dissolved particles break up, but not completely, and bear electric charges. The resulting particles are large enough to be detected by the ultra-microscope, and their weight, while great enough to make them settle out in time, is prevented from acting by their electric charge. That is, as such particles settle downward, the electric charge of particles already in the lower part of the liquid drives them upward again. Thus they are kept evenly distributed throughout the solution. Any substance which enters into colloidal suspension is called a **Colloid.**

# Books on the Physical Sciences

## GENERAL

The Sciences. Edward S. Holden.
Experimental Science. George M. Hopkins.
Short History of Natural Science. Arabella B. Buckley.
Story Lives of Men of Science. F. J. Rowbotham.
Children's Stories of the Great Scientists. Henrietta C. Wright.
Boys' Playbook of Science. John Henry Pepper.
Outline of Science (4 vols.). Edited by J. Arthur Thompson.
Discovery—the Spirit and Service of Science. R. A. Gregory.

## PHYSICS

First Course in Physics. Millikan and Gale.
College Physics. Carhart and Chute.
Physics. Mann and Twiss.
Mechanics, Molecular Physics, and Heat. Robert A. Millikan.
Electricity, Sound, and Light. Millikan and Mills.
Electricity for Everybody. Philip Atkinson.
Conversations on Electricity. Joseph G. Branch.
How and Why of Electricity. Charles D. Child.
Easy Electrical Experiments. Leonard P. Dickinson.
Wonder Book of Magnetism. Edwin J. Houston.
Elementary Lessons in Electricity and Magnetism. S. P. Thompson.
Heat as a Mode of Motion. John Tyndall.
Sound. Poynting and Thomson.
Theory of Light. Thomas Preston.
Theory of Optics. Paul Drude.
Wave Theory of Light. Henry Crew.
Mirrors, Prisms, and Lenses. James P. C. Southall.
The Theory of Modern Optical Instruments. Alexander Gleichen.
Radium and All About it. Selimo R. Bottone.
Radio-Activity. Ernest E. Rutherford.
Interpretation of Radium. Frederick Soddy
Thinking It Out; a Popular Exposition of Mechanics. Archibald Williams.
Applied Mechanism for Beginners. John Duncan.
Mechanics and Some of Its Mysteries. Valentine E. Johnson.
Soap Bubbles and the Forces which Make Them. Charles Boys.
Matter and Motion. J. Clerk Maxwell.
Gases of the Atmosphere. Sir William Ramsay.
Discharge of Electricity Through Gases. J. J. Thomson.
The Electron Theory of Matter. O. W. Richardson.
Electrons. Sir Oliver Lodge.
Electricity and Matter. J. J. Thomson.
Easy Lessons in Einstein. Edwin E. Slosson.
Relativity; the Special and General Theory. Albert Einstein.

## CHEMISTRY

The Boys' Book of Chemistry. Charles R. Clarke.
The Amateur Chemist. A. Frederick Collins.

**Everyman's Chemistry.** Ellwood Hendrick.
**Chemistry for Young People.** Tudor Jenks.
**Modern Chemistry and Its Wonders.** Geoffrey Martin.
**Practical Chemistry.** N. Henry Black and James Bryant Conant.
**Everyday Chemistry.** Alfred Vivian.
**Chemistry in Daily Life.** Lassar Cohn.
**The Chemistry of Commerce.** Robert K. Duncan.
**Story of Alchemy and the Beginnings of Chemistry.** Matthew M. P. Muir.
**A History of Chemistry.** F. J. Moore.
**Essentials of Chemistry.** Hessler and Smith.
**The Elements of Chemistry.** Ira Remsen.
**Elementary Study of Chemistry.** McPherson and Henderson.
**Descriptive Chemistry.** Lyman C. Newell.
**Conversations on Chemistry.** Wilhelm F. Ostwald.
**Fundamental Principles of Chemistry.** Wilhelm F. Ostwald.
**Intermediate Text-book of Chemistry.** Alexander Smith.
**Creative Chemistry.** Edwin E. Slosson.
**General Chemistry for Colleges.** Alexander Smith.
**College Textbook of Chemistry.** Ira Remsen.
**Principles of Inorganic Chemistry.** H. C. Jones.
**Modern Chemistry.** Sir William Ramsay.
**Inorganic Chemistry.** Ira Remsen.
**Recent Discoveries in Inorganic Chemistry.** J. Hart-Smith.
**Organic Chemistry.** Ira Remsen.
**The Principles of Organic Chemistry.** James F. Norris.
**A Textbook of Organic Chemistry for Students of Medicine and Biology.** Elmer Verner McCollum.
**Practical Organic Chemistry.** Julius B. Cohen.
**Foods: Their Composition and Analysis.** Alexander W. Blyth.
**Spectroscopy.** Edward C. Baly.
**Introduction to the Rarer Elements.** Philip E. Browning.
**Practical Electro-Chemistry.** Bertram Blount.
**Outlines of Electrochemistry.** H. C. Jones.
**Argon and Its Companions.** Sir William Ramsay and Morris W. Travers.
**Elements and Electrons.** Sir William Ramsay.
**The Elements of Physical Chemistry.** Harry C. Jones.
**An Introduction to the Physics and Chemistry of Colloids.** Emil Hatschek.
**The Physical Chemistry of the Proteins.** T. Brailsford Robertson.
**Chemistry for Photographers.** Charles F. Townsend.

# ASTRONOMY

ASTRONOMY has been called the "Mother of all the Sciences." Long before any of the other great sciences had been organized, men were busy investigating the mysteries of the heavens, and out of the speculations and observations of these early "star-gazers" came some of the most profound scientific truths. Among the great names associated with Astronomy are those of Ptolemy, Tycho Brahe, Copernicus, Galileo, Kepler, Newton—all leaders in the science of their day. So we must not think that a knowledge of the Sun and the Moon, the Planets and the Stars is far removed from the practical affairs of our daily life. Not only is Astronomy fascinating and full of inspiration in itself, but an understanding of its chief principles is absolutely necessary to a proper grasp of most of the other branches of knowledge whose fields lie much nearer home.

I. **THE HISTORY OF ASTRONOMY: 239.**
   - A. **Astronomy in Ancient Times:**
     - a. **Teachings of Pythagoras and His Brotherhood: 2941.**
     - b. **Theory of Ptolemy: 2931.**
   - B. **Beginnings of Modern Astronomy:**
     - a. **Copernicus, the Founder of Modern Astronomy: 880.**
     - b. **Galileo's Discoveries with His Telescopes: 1391.**
     - c. **Contributions of Tycho Brahe and Johann Kepler: 1920.**
   - C. **Isaac Newton and the Discoveries that Revolutionized the Study of Astronomy: 2476.**

   **Note:** The other important steps in the history of Astronomy will be brought out in connection with the study of the scientific details of the subject. This method will make clearer their relative importance.

II. **FUNDAMENTAL LAWS OF THE PHYSICAL UNIVERSE:**
   - A. **Mechanics: 2187.**—Newton's Laws of Motion: 2190.
   - B. **Gravitation: 1506.**
   - C. **Light: 1997.**—Ether and How Light Travels Through It: 1180.

III. **THE SOLAR SYSTEM:**
   - A. **Theories About Its Origin:**
     - a. **The Nebular Theory: 2433.**
     - b. **The Planetesimal Theory: 2819.**
   - B. **The Sun and Its Relation to the Solar System: 3392.**
     - a. **The Sun's Power of Gravity: 3394. How It Holds Together the Planets.**
     - b. **How the Sun Supplies the Earth with Heat and Energy: 3394, 1148.**
     - c. **Sun-spots and Other Phenomena on the Sun's Surface: 3395.**
   - C. **Planets: 2815.** Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune.
     - a. **Size, Distance from the Sun, and Speed of Revolution Around It: 2816.**
     - b. **Some Curious Facts and Unsolved Questions About the Planets:**
       1. Light and Heat on Venus: 2817, 2819 (picture).
       2. Cause of Saturn's Rings: 2817.
       3. How Uranus and Neptune were Discovered: 2818.
       4. Is There Any Life on Mars? 2818 (picture).
     - c. **Kepler's Laws of Planetary Motion: 1921.**
   - D. **Asteroids: 237, 238** (picture).
   - E. **Comets: 849.**
     - a. **Regular or Periodic Comets and Unexpected Comets: 850.**
     - b. **Peculiar Tricks of the Comet's Tail: 849.**

F. Meteors and Meteorites: **2202.**
  a. Origin of Meteors: **2202.**
  b. Cause of Meteoric "Showers": **2202.**
  c. Life and Death of a Meteorite: **2203** (picture).
  d. How a Study of the Composition of Meteorites Helped to Give Us "Nickel Steel": **2204.**

IV. THE EARTH AND ITS PLACE IN THE SOLAR SYSTEM:
  A. The Earth's Story: **1058.**
    a. Theories About Its Origin: **1058.**
    b. Composition of the Earth's Crust: **1058.**
    c. Some Ancient Ideas About the Earth: **1059** (pictures).
    d. How It was Proved that the Earth is Round: **1061** (picture).
    e. Explanation of the Seasons: **1063** (picture).
    f. Some Statistics About the Earth: **1063, 1064.**
  B. The Earth's Relations to Its Neighbors:
    a. Eclipse: **1074.**
    b. Equinox and Solstice: **1173, 3840.**
  C. The Moon: **2318.** The Earth's Only Satellite and Its Behavior.
    a. Theories About Its Origin: **2320.**
    b. Its size and Surface: **2318, 2322, 2319** (picture).
    c. Conditions on the Surface of the Moon: **2321.**
    d. Its Relations to the Earth and Sun:
      1. How It Causes the Tides: 3496.
      2. Phases of the Moon: 2318.

Note: See also the Outline on Physical Geography, pages 3861, 3862.

V. STARS AND CONSTELLATIONS: **3340, 872.**
  A. Number and Size of the Stars:
    a. How the Stars are Counted: **3340.**
    b. How the Sizes of the Stars are Measured: **3344.**
  B. Brilliancy of the Stars and Distance from the Earth:
    a. What "Magnitude" Means: **3342.**
    b. Dark or Dead Stars: **3340.**
    c. How Distances of the Stars are Measured: **3341.**
  C. Composition of Stars and How It is Determined with a Spectroscope: **3343, 3311.**
  D. Position of the Stars:
    a. Arrangement in Constellations: **872.**
    b. The Milky Way: **3341.**
    c. Nebulae: **2432.**
    d. The Zodiac and What It Means: **3840.**

VI. OBSERVATORIES AND ASTRONOMICAL INSTRUMENTS: **2551.**
  A. Plan and Functions of the Observatory: **2551.**
  B. Important Instruments Used by the Astronomer:
    a. Telescope and How It is Operated: **3462.**
    b. Spectroscope and What It Reveals: **3311.**
    c. Use of the Camera in Astronomy: **2552.**
    d. The Spectroheliograph: **2552.**

VII. THE CALENDAR IN ASTRONOMY: **573.**
  A. The Year:
    a. How It was Determined by the Sun: **574.**
    b. Why We Have Leap Year: **574.**
  B. The Month:
    a. How It is Determined by the Moon: **2317.**
    b. Origin of the Months and How They were Named: January 1861; February 1229; March 2145; April 162; May 2175; June 1902; July 1902; August 257; September 3175; October 2559; November 2542; December 971.
  C. The Week and How it was Determined by the Moon's Phases: **3713.**
  D. The Day: **969.**
    a. How the Days were Named: **969.**
    b. How the Day was Determined: **969.**
    c. How the Date for Easter is Calculated: **1070.**
  E. Calculating Time: **3500.**

# Picture Aids to the Study of Astronomy

The Planet Eros 238.
How to Find Your Way by the Stars 239.
The Wonders of Astronomy and Some of Its Uses 241.
Saturn and Its Rings 243.
Discovering a New World by Mathematics 245.
How Neptune Interfered with Uranus 246.
One Theory of What Causes the Northern Lights 260.
How the Sun Twists the Comet's Tail 850.
Halley's Comet on Its Last Round Trip 851.
The Strange Creatures You Can See in the Sky 873.

Some Ancient Ideas about the Earth 1059.
When East Met West in 1521, 1061.
Why Summer Comes But Once a Year 1063.
The Shadows of an Eclipse 1074.
"Hide-and-Seek" in the Heavens 1075.
How a Little Apple Started a Big Idea 1507.
How Gravity's "Pull" Affects Weight 1508.
Galileo's Epochal Experiment 1509.
How Men Learned that Light Does Not Travel Instantaneously 1997.
Interesting Tricks that Light Plays 1999.
Blazing Stones that Fall from the Sky 2202.
Life and Death of a Meteorite 2203.
A Huge Visitor from the Skies 2204.
Size of the Moon as Compared to that of the United States 2318.
How Lack of Atmosphere Affects Scenery 2318.
The Barren Landscape of the Moon 2319.
Gravity of the Earth and Moon Compared 2320.
Distance of the Earth from the Moon and Sun 2321.
Bringing the Moon Home to Us 2322.
How Astronomy Tells Ships Where They Are 2421.
The Great Nebula in Andromeda 2433.
The Famous Yerkes Observatory 2551.
Home of the World's Largest Reflecting Telescope—Mount Wilson Observatory 2552.
Children of the Sun—The Earth's Sister Planets 2815.
Facts About the Planets 2816.
How the Heavens Would Look if We Lived on Saturn 2817.
Is There Any Life on Mars? 2818.
The Strange Climate of the Planet Venus 2819.
The Rainbow in a Beam of Sunlight 3311.
What the Spectroscope Tells About the Stars 3313.
The Countless Suns That Dot the Heavens 3340.
Measuring Distances to Stars 3341.
A Star that Makes Our Sun a Pigmy 3342.
The "Milk" in the Milky Way 3343.
Flaming Storms on the Sun's Face 3393.
The Midnight Sun 3394.
Sun Flames Bursting Forth 3395.
How the Astronomical Telescope Works 3463.
What Makes the Tides? 3497.
Standard Time and the International Date Line 3501.
The Signs of the Zodiac 3840.

# Books for the Astronomy Student

## THIRD TO SIXTH GRADES

Star-Land. R. S. Ball.
Stars Shown to the Children. Ellison Hawks.
Stars in Song and Legend. Jermain Gildersleeve Porter.
Earth and Sky Every Child Should Know. Julia Ellen Rogers.
Giant Sun and His Giant Family. Mary Proctor.
Stories of Starland. Mary Proctor.
Earth and Sky. Edward Singleton Holden.

## SEVENTH AND EIGHTH GRADES

Boys' Book of Astronomy. Ellison Hawks.
Elements of Astronomy. Simon Newcomb.
Book of Stars for Young People. Geraldine Edith Mitton.
Astronomy with an Opera Glass. Garrett P. Serviss.
The Stars and Their Mysteries. Charles R. Gibson.
Astronomy from a Dipper. Eliot Channing Clarke.
The Romance of Modern Astronomy. Hector Macpherson.
Sun, Moon, and Stars. Agnes Giberne.
Book of Stars. Archie Frederick Collins.
Family of the Sun. Edward Singleton Holden.
The Sciences. Edward Singleton Holden.
Triumphs of Science. Martha A. L. Lane.
Trees, Stars, and Birds. Edwin Lincoln Moseley.
Wonders of Science. Eva March Tappan.

## HIGH SCHOOL AND AFTER

Astronomy for All. B. H. Burgel.
The Call of the Stars. J. R. Kippax.
Comets and Meteors. J. R. Kippax.
The Ways of the Planets. M. E. Martin.
First Observations in Astronomy. M. E. Byrd.
Descriptive Astronomy: An Elementary Exposition of the Facts, Principles, and Theories of Astronomical Science. F. R. Moulton.
The Essence of Astronomy. E. W. Putnam.
Astronomy in a Nutshell. Garrett P. Serviss.
Astronomy. George F. Chambers.
The Destinies of the Stars. Svante A. Arrhenius.
Star and Weather Gossip. Joseph H. Elgie.
Splendors of the Sky. Isabel Martin Lewis.
Popular Guide to the Heavens. Sir Robert Ball.
Story of the Heavens. Sir Robert Ball.
Easy Star Lessons. R. A. Proctor.
Astronomy. Harold Jacoby.
The Moon in Modern Astronomy. Philip Fauth.
The Sun's Place in Nature. Sir J. N. Lockyer.
Modern Astronomy. H. H. Turner.
Evolution of the Stellar Systems. T. J. J. Consult.
Evolution of the Worlds. Percival Lowell.
Popular History of Astronomy. Agnes M. Clarke.

# Interest-Questions in Astronomy

What did astronomy have to do with the discovery of America? 239.
How did one planet "missing from its place" help us find another planet? 244.
How did an apple help to tell how the worlds are kept in place? 1506
What would happen if the earth struck a comet's tail? 849.
When does the comet's tail precede and when does it follow the comet? 849.
How do we know that "nothing ever happens" on the moon? 2318.
Why was there no such day as "October 5th" in the year 1582? 574.
How can you sail in a ship "from today to yesterday"? 3501.
Traveling 150 miles an hour in an airplane, how many years would it take you to reach the sun? 3394.
What has the sun to do with winds on the earth? 3392.
In the six seconds it takes you to read this question, how many hundred miles have you traveled through space? 1063.
Why do scientists believe the earth is at least 100,000,000 years old? 1060.
Light travels with speed enough to flash around the earth more than seven times in a second. How many years does it take the light from the nearest star to reach us? 3340.
What makes a star twinkle? 3342.
How many stars make the "North Star"? 3342.
What leads some scientists to think there may be inhabitants on the planet Mars? 2816.
What planet wears an enormous ring? 2817.
What sets a meteor on fire? 2203.
How was the earth weighed? 1064.
How did the moon give us our week? 3713.
How can we photograph today a beam of light which left "home" 36,000 years ago? 243.
How has science been able to tell what stars are made of, even those which are far too distant to be seen with the naked eye? 3313.
Have you ever seen the other side of the moon? 2320-21.
How many stars are there? 240.
If you could travel at the speed of light, how long would it take you to reach the nearest fixed star? 240.
How is time measured by the sun? 797.
How many days did Russia lose when she accepted the new style calendar? 574.
What constellation is named for the mythical twin sons of Zeus? 657.
What is the difference between the sun day and a star day? 969.
Who established the theory that the earth revolved about the sun? 880.
How far is the earth from the sun? 1064.
Why can't the solar year be divided evenly into months and days? 574.
By what method are the solar year and the calendar year kept together? 574.
What keeps the planets in their paths? 1506.
How can you find your way by the stars? 239 (picture).
Why were many large constellations not known to the Greeks? 872.
Why does summer come only once a year? 1063 (picture).
When can the stars be seen in the daytime? 1074.
What are "shooting stars"? 2202.
How has the moon helped to start big cities? 2323.
How do we know there are "dead" stars? 3340.

# MODERN EDUCATION and PROBLEM-PROJECT TEACHING

by WILLIAM B. OWEN

Principal of the Chicago Normal School and President of the National Education Association, 1922-23.

TEACHING implies a teacher and one who is taught. It is a form of communication between human beings. There is the further assumption that the teacher knows something that the one who is taught at least does not fully know and perhaps would like to know. Teaching is a very ancient form of human intercourse. It has an unbroken history from the times of the Greeks and Romans down to the present time. People who have taught successfully have left us a record of how they did it, written either by themselves or others. Then the process of teaching has been analyzed and described by students of the human mind and by practical teachers.

In modern times, particularly since the middle of the eighteenth century, there has been produced an extensive and valuable literature on the science and art of teaching. A careful study of this literature reveals the fact that each advance in our ideas and methods of teaching is dependent on and related to some new view of human nature, derived either from practical experience or from some science like psychology, physiology, or sociology, that treats of some aspect of human nature. Any treatment of teaching, it would seem, will inevitably bear the marks of the time in which it is written. To find a new theory and practice of teaching bearing a new and strange name challenges the attention and creates a demand to understand it in itself and also to find what new way of thinking about human nature gave rise to it. A very important illustration is the new view of teaching which bears the title at the head of this article. It is a thing of about a decade in its history. The treatment that follows will be set forth under the following heads:

I. Education
II. Teaching
  A. The Pupil
  B. The Teacher
  C. The Course of Study
III. The Problem Project Method
  A. The Project as Individual Thinking
  B. The Project as Social Thinking

## I. EDUCATION

All sensible people value education. All civilized peoples have worked out some form of education. Even semi-civilized and barbarous tribes have what may be called a kind of education. Ever since the civilization which we have inherited had its beginnings among the peoples whose lands bordered the Eastern Mediterranean, education has been one of the means of maintaining and developing that civilization. Education has a history as well as government, agriculture, trade, manufacturing, art, music, science. One has to be educated in order to be civilized.

We speak of education in two senses. In the narrower sense, education is what we learn in school or in our vocations, when what we do is carried on primarily for the sake of what we learn or the training we receive. This may be called formal education. But we also receive education by participating in an activity or work that is not planned to educate us. A farmer's boy receives education in farming by helping his father in making hay. The father does not make the hay in order to educate his son, but that he may have feed for his horses and cattle in the winter. Such education may be called incidental education. Under one form or another education continues throughout life. No one can escape it. Experience shows, however, that in general those are best educated who have had an opportunity in the earlier years of their life to get the formal education that the institutions of their country provide. This statement, however, does not overlook the fact that many persons of great ability and industry have acquired a good education through their own efforts. They have made unaided use of the means of education afforded by the society in which they lived.

### How We Educate Ourselves

This leads us to observe that on the one hand we educate ourselves and on the other hand we are educated by others. Education begins in the family and starts at birth. It is a great advantage to be born in a good family. Good habits, good books, good conversation, travel, right ideals, refined tastes, correct speech fashion the growing minds. The good family contributes to the success of the formal education received in school and college. No single institution alone, but all institutions coöperating educate us. And yet at the same time all education is self-education. Schools and other institutions constitute opportunities which we can neglect and disregard or seize and utilize. It is easier to get an education under good teaching than to go it alone. But a good teacher makes little headway with an unwilling or indifferent pupil. A poor teacher and a poor pupil defeat each other. A poor teacher cannot prevent a good and ambitious pupil from getting an education. Books, newspapers, pictures, acquaintances and friends, and the demands of our work in our callings and professions supplement and continue the formal education of the schools. We must not underestimate the contribution made to our education by the schools. But we are not likely to overestimate the extent to which we are responsible for educating ourselves, both in the schools and by the use of the means at hand outside the schools.

### What We Mean by Education Today

We have been discussing education just as if we had already agreed on what we mean by it. In a broad sense, we do. But just as soon as we begin to go into it more deeply, it becomes necessary to come to an understanding about it, if we are to understand one another. There

have been many definitions of education formed during the past centuries. No one seems entirely adequate. The older ones do not satisfy us because they do not fit our way of thinking today. Each seems to have been made to meet the needs of the time. Perhaps we must be content to adopt one that harmonizes with the thought of our own time.

For more than a century the scientific world and in consequence the practical world have been emphasizing the study of living things. Exploration and travel have brought to light countless new forms of plant and animal life. These have been studied, described, compared, and classified. Then the microscope has revealed their internal structure. Technical methods of staining and preparing their tissues have made this revelation more complete. The outcome of this study has been an increased knowledge of living things that has changed our way of thinking about them.

Moreover the methods of studying them and the conclusions drawn from this study have profoundly affected not only our thought but the language we use in older sciences that deal with human life in all its aspects. Because we use the term biology to cover the fields of plant and animal life, we say that we look upon life in general from the biological point of view. Perhaps the most fundamental fact about living things is that they grow. The individual grows from conception to maturity. The race grows by reproducing its kind. The processes by which life maintains growth through individual and race form the subject matter of the sciences that deal with living things. It is but natural therefore that this activity should affect our view of education. Some of the foremost students and writers on education have boldly adopted this fundamental notion and have defined education as growth.

### What is Growth

To say that education is growth forces us to think more closely about growth. When we talk about living things growing we have several notions in mind. When a plant grows it increases in size. We mark the growth of children by measuring their height. Again growth may imply increase in weight. Standards of growth for children are expressed in terms of height and weight. Size and weight are the two most apparent measures of growth. There is at least one other, not so simple to apply, but really more important, namely differentiation in structure and function. Plants do not merely increase in size and weight as they grow. They change in shape and make-up. They do not expand like a toy balloon. They put forth leaves, they flower, they bear fruit, they produce seeds and shed them. Insects grow and many pass through wonderful changes in form and activity. Lower forms of animal life, like the frog, for example, rival the insects in their transformation. It is very easy to recognize stages in their growth.

Human beings grow in the same way. They increase in size and weight up to a certain point. They change in structure and function more than we are careful to realize. They pass through stages of growth. One of the most interesting and valuable fields of investigation of the present day is the growth of children. As a result of what has already been learned, the practice of education, in theory at least, has been greatly changed to the advantage of the children.

So far we have been talking about bodily growth. That is objective, can be observed and measured, recognized by all. Education is not merely bodily growth. We think of it chiefly as growth of the mind. And here we may profitably dwell on a result of the biological study that we have mentioned above that has had a great influence on our modern views of education. Until relatively recent times the mind with its activities has been studied as if it had an existence separate and independent of the body. Of course every one thought of the mind as being associated with the body. The mind used the body as an instrument. But the assumption was that the mind could be understood in disregard of the body.

Modern psychology, which is the science of the mind, takes the biological viewpoint. It is a mind-body psychology. It assumes that the life of the mind cannot be understood without taking into account the life of the body. Activities of the mind are followed by activities of the body. Activities of the body are followed by activities of the mind. A good deal of modern psychology is devoted to the working out of specific correlations between these two parts of the mind-body organism which we call a human being. Some of the relationships are easy to determine. We must stimulate the eye to produce color. Different wave lengths of light must reach the eye to produce the different colors. The papillae of the tongue must be stimulated to induce the taste of salt, sweet, bitter, sour. And so on with the various sense organs located throughout the body. Conversely, we can worry ourselves sick. Fear increases the heart action or causes us to faint.

More important than these more apparent relationships, there is a constant correlation between the action of the mind and that of the brain. If we could see and experiment with the brain as easily as we do with the eye, the ear, the hand, the skin, we should be able, perhaps, to understand and control the mind much better than at present. But we know enough to be able to say that the mind develops and grows as the body grows. There are stages of bodily growth. Education is growth. When the body has reached its maximum in size and weight, there is a growth in the brain that goes along with the growth of the mind. That growth is not chiefly one of size or weight, but of new connections between the elements of the brain structure. The details of this growth and the facts and laws of this mind-body life are what the science of psychology teaches us. Enough has been said to make clear why in our day it is both natural and reasonable to think of education as growth.

### The Growth of Experience

Thus we have seen that we got the notion of education as growth from the study of the growth of the body and mind together and that a careful study of the body is necessary to an understanding of the mind. Yet we do not get all our idea of growth from that of the body. We have our own experience to draw on. Experience, too, grows. We believe that in some way our experience is always a mind-body experience. But we know a good deal more about it than we can get by studying the body alone. We can study our own experience first-hand. When we do, we recognize that we do not just have it. We take a hand in it, plan it, direct it, at least, as far as we can. The idea or concept of experience is fundamental in education. It is not possible to define it, but we all know what we mean. It is an inclusive term for all that we go through. In the case of each one of us, it reaches back as far as memory takes us. As we look back on it, we think of it as a continuous development.

We expeet it to continue out into the future. We plan it ahead and strive to realize our expectations of it.

So we say that experience grows. It does not grow in size, in a strict sense, although it does enlarge, expand, lengthen. We measure it in time, not in space. Its growth is one of structure and organization. Its parts are connected together in new ways. Thus we use our experience to get new and different experience. It might be said that education is a process of getting, organizing, and enjoying experience. We can put the ideas of growth and experience together and say that education is a growth in experience, or a growth of experience.

## II. TEACHING

Teaching is in some fashion the art of directing the growth of pupils in experience. No one definition will suffice to describe all that teaching is. Certain fundamental facts about it must be kept in mind if we are to understand it.

The pupil plays his part in the teaching process. The simplest way to describe that part is to call it learning. But learning may mean something too restricted, too narrow, like committing to memory. It is necessary to take a broader and truer view, if his part is to be understood. The teaeher plays a part in the teaching process. One way to describe that part is to say that the teacher instructs. But this word, in turn, is too limited in its meaning. Instruction is but one phase of a much wider activity that the teacher carries on. To describe teaching eorrectly, or to carry it on successfully, one must take the larger view of the teacher's work.

But what the pupil does and what the teacher does is determined in large part by what the eourse of study or the curriculum lays down for the one to learn and the other to teach. That pupil and teacher may not work at cross purposes there must be a broad and clear idea of what a course of study really is, how it should be organized, what its meaning is, what its aims and results should be. The discussion of teaching that follows will be taken up under three heads: 1, the pupil; 2, the teacher; 3, the eourse of study.

### A. THE PUPIL

There are three outstanding assumptions that underlie all modern theory in regard to human nature which must be kept in mind in any effort to understand the pupil's part in the teaching process. These assumptions or points of view are: (a) the pupil is active; (b) the pupil is individual; (c) the pupil is social. These points of view will be developed far enough to make it possible to understand the treatment of teaching which follows. Without such an understanding, the meaning, consistency, and real simplicity of the different subjeets expounded might escape recognition.

#### (a) The Pupil as Active

It took the world many hundreds of years to arrive at the idea that the human mind is essentially active. In ancient times it was compared to a wax tablet on which words are written with a stylus. In modern times the same assumption was made when it was compared to a blank piece of paper ready to be written on. No wonder that education was thought of as consisting of committing to memory and the teacher's work that of impressing words on the pupil's mind. The same increase in knowledge that has led to the view that education is growth has forced us to the realization that the mind is aggressively and unceasingly active. Human nature is dynamic. The body is a machine that transforms energy. Food is taken into it and is used to build tissue and furnish the power to do work. This energy manifests itself in muscular movement, in locomotion, in lifting and pulling and pushing. It flows over into the nervous system and charges the brain. Through the sense organs the brain aehieves contact with the world and is stimulated to respond in manifold ways. The current of dynamic power flows from the world into bodies and from bodies out into the world.

But as we have seen, the body is a mind-body organism. Bodily energy is but the one phase, while mind energy is the other. The mind is active even when we are asleep. There is little difficulty in accepting this view with regard to the outward activities of children. It is a common saying that they are never still, that they cannot sit still. They kick, walk, run, laugh, talk, play incessantly. Grown people keep still because they have learned how. Their minds are active in ways that do not appear on the surface. While they may be outwardly at rest, their minds are at work, remembering, imagining, planning, hearing, hating, loving. The outer world of men and things does not so much set them to acting as direct them into new ways of acting. In a fundamental sense they are always aetive. The vast new literature of education, particularly that dealing with children, cannot be understood unless one keeps in mind that it all is written from the fundamental assumption that has just been set forth.

#### (b) The Pupil as Individual

A second assumption is that each person or pupil is an individual. At first thought it would hardly seem necessary, much less important, to stress such an obvious fact. The necessity arises from the fact, to be emphasized later, that he is also social. He is both individual and social at the same time. Not only must it be recognized that there are these two aspects of the pupil's life, but it is of first importance to recognize when we are treating him as one or the other.

Again it is the last century that has led to the recognition of this twofold nature of human beings. The naive assumption is that each person has a separate life of his own, that he is a complete unit in himself. It was but natural, therefore, to think of him as self-contained, growing up within himself, getting his own education, living his own life. To be sure, all this is true of him according to the modern view as well. But when it comes to understanding and controlling his life and activity, it becomes necessary to take into account that he is as truly and constantly social as he is individual.

Certain outstanding factors in the individuality of a human being must be kept in mind. Every one has an individual body. This body has its own peculiar character. It is male or female, it is tall or short, heavy or slight. It has color, contour, carriage that is distinctive. Countenances are much alike yet different. Twins are hard for strangers to distinguish. Family likeness marks children of the same family. Yet it is claimed that no two people register identical finger-prints. While others identify our bodily appearance with more or less readiness, we have no such difficulty ourselves. We live with it, get familiar with its inner and outer feel, learn its strength and weakness, its skill and awkwardness, its fatigue and energy. It is a constant part of what we call ourselves.

But the body is not all of us. Each of us has a self. This self, when we come to think of it, seems to be the very centre and core of our being. It is more intimately "I" than even our body. The self persists through the days and years of our lives. Memory carries us back to early childhood and it is the same self at the dawn of recollection. To be sure, the self has grown with the body through the years. It has broadened out, has experienced many times and places and people and things. It has overcome weaknesses and faults. It has acquired courage, skill, knowledge, forethought, wisdom. The self has peculiar habitats. It is one kind of a self in the family, another in the school, another in business, another in public life. Though it seems to be many, it does not cease to be one.

It is the individual self that is contemplated by most of our educational literature and the practice of the schools. Intelligence tests are given to find what individual ability a pupil possesses. Achievement tests attempt to rate his attainment in arithmetic, reading, writing, English composition, and the like. Other tests are being devised to enable teachers to compare the mechanical skill and the social ability of individual pupils with others.

### (c) The Pupil as Social

But the pupil is also social. Briefly stated, this means that his life is carried on in some sort of interaction with others. Put in other words, his activity can be understood only as other human beings are taken into account. Every child is born of a social group and born into a social group. His body is social in its origin and its reference. Through his parents he combines two family stocks. He reproduces in himself qualities of his forebears. His abilities are inherited. His temperament and talents are likewise inherited. He is endowed to respond to stimuli proceeding from others. His impulses and instincts are called out and directed toward people. Fear, laughter, anger, pride, shame, emulation, love, hate, all imply a world of others. Gesture, language, communication are manifestations and results of a social nature. Sympathy, suggestion, imitation are conceivable only in a world where other selves or people are.

The varied activities, emotions, and tendencies enumerated above are sufficient to make clear what is meant by saying that the pupil is social. He is by nature adapted to a social environment and that environment actually releases and directs his active, social nature. Another consideration is of fundamental importance. The child is born into a going society. From the very first, society, through the groups in which he lives, imposes on the child its customs and habits. He is thus changed into the likeness of the people about him. His language, habits of eating, working, playing, sleeping are taken over. The family into which he is born leaves its impress on him before he goes to school. The school, in turn, puts him through a process of acquiring habits, skills, and ideas that increase enormously his power to react to society. At any point then, a child or a pupil must be thought of not only as individual, but as social, if he is to be understood, directed, and educated.

Modern progress in education has been determined chiefly by the effort made to understand the growth of children and to make teaching, schools, and the whole life of children in and out of schools favorable to that growth. To think of children as dynamically active, as being individual and at the same time social is to place oneself at the point of view from which the development in teaching method and technique is best understood and best mastered.

## B. THE TEACHER

All that has been said about the pupil would hold true in kind of the teacher. She is older, knows more, has been trained to teach, has authority and prestige and has her main purpose fixed by her calling. She is present to teach the pupils. But just what precisely she is to do depends on what the nature of teaching is. In the past, when the school was supposed to fix in the minds of the pupils a fixed and given subject matter, the teacher's work seemed very definite. The pupil was supposed, particularly in early years, to be a sort of memorizing machine. Repetition was regarded as the fundamental law of memory. The teacher's task, therefore, was to secure an adequate amount of committing to memory either in school or out of school. The class-room activity of the pupil was to recite, that is, to repeat aloud what the teacher had assigned to him to learn, so that the teacher might know that he had learned it. Often this recitation was an individual matter between the pupil and the teacher. Competition between pupils in learning and reciting was introduced to stimulate effort.

Now learning is a very important part of education. Modern educational method is laying great stress on this part of school work. We are learning how to learn. Many experiments have been carried on to find out under what conditions learning is best carried on, just how and when to repeat in order to fix firmly in the memory. Tests are devised to measure how well something has been learned. But the difference between modern education and the older education lies in the fact that memorizing is regarded as only a phase of learning and learning in turn is only a part of the larger education of the pupil. The teacher is to guide and direct this larger growth of the pupil. She must look upon her work from a truer and broader standpoint. Others must regard her and judge her as engaged in a more comprehensive work.

The truest and best view of the teacher is to consider her as being what she is—the leader of a social group. The pupils that gather into the class, because of their very nature, form a real group. By nature and training they communicate with one another, they have common experiences, common habits, common feelings, common ideas, common ideals. In order to live and work together such a group must work through a leader. The teacher, because of her age, experience, prestige and authority assumes the leadership. If she is a poor or weak teacher, sometimes an aggressive pupil takes temporarily the leadership from her. Sometimes the good teacher places leadership for the time being and for certain purposes in the hands of one or another of the pupils. But every school room has a teacher whose function is to lead the group.

## C. THE COURSE OF STUDY

The pupils and the teacher are an organized group under teacher leadership. But their work is cut out for them, so to speak. They have certain subjects to study. Often the studies are presented in text books adopted by the school authorities. The time given to each subject a week is often prescribed. Then the subjects are graded to fit the school year and the average age of the children in the grade. All that is prescribed for the children to study in the grades of the school constitutes the course of

study, or curriculum of the school. The course of study in a single subject is whatever of that subject is studied in the different years of the school.

Needless to say, the experience of the teachers in teaching and the pupils in learning has led to a pretty careful selection and adaptation of subject matter to fit the maturity of the pupils. Custom, habit, tradition has a great deal to do with deciding what shall be in the course of study. In general, it is easy to say that the schools teach what the pupils can best learn in the school and what will be most useful to them when they leave school. As a matter of fact, the principle is not easy to apply. Material is frequently taught in school after it has ceased to be of use to the pupil. Other subjects that are new but important are introduced into the crowded course of study only with difficulty after long effort. More important for the present purpose is to recognize that the real course of study is not found in the text books, nor in the outline prescribed by the school authorities. These seem but to suggest or symbolize the real course of study.

The course of study is what the pupils and teacher do together in the school room. For the pupils, it is the experiences of the school with all that implies. For the teacher, it is the experiences that she makes possible to the pupils through organization, selection, and presentation of materials, books, activities, and enterprises. What she considers to be teaching will determine largely whether the course of study shall mean to the pupils a limited subject matter slavishly memorized and mechanically recited, or a large, rich, and developing experience which the teacher enables the school-room group with her assistance to acquire, interpret, and control.

## III. THE PROBLEM-PROJECT METHOD

By method is meant the way of doing something. Every art and practice develops its method. To have method means to have a purpose to accomplish and a way of accomplishing it that is economical of time and effort and, therefore, easy as compared with the way of the beginner and unskilled. A new method of teaching and learning is a new way of doing these things. The problem-project method of teaching is new in its emphasis and its conscious procedure. It is not new in many of its elements. All good teaching has always had something of the new method in it. To understand the method, it is necessary to know its origin and to be able to appreciate its scientific and practical foundations. Once these are firmly grasped, the method itself is readily understood and applied.

Various attempts have been made to define the project. All these attempts agree in one fundamental thing, that a project is an activity carried on with a purpose. Some have defined the project, therefore, as a purposeful activity. Others, while making purpose fundamental and necessary, maintain that the activity must be carried on in its natural setting. Just what setting is natural is not clearly brought out. So far as this emphasis on the natural setting of a problem tends to call attention to the fact that the work of the school room is often very artificial, it is well that it be made. If, however, the demand for a natural setting is to lead to a slavish imitation or reproduction of conditions outside of school in order to be natural, the danger is great that projects may become as artificial as the forms of teaching they are supposed to displace. It would seem safe, at any rate, to assume as fundamental to the idea of a project that it is an activity carried on with a purpose. To act with a purpose is to think. Thinking is problem-solving. To teach by projects is to create conditions under which pupils are led to attempt the solution of problems requiring them to investigate, organize, and test their own conclusions.

### Difference Between Problem and Project

Before turning to the more detailed consideration of the subject, let us first clear up the difference between the words problem and project. So far as the words themselves are concerned they are really synonyms. Problem is a Greek word meaning something set before one to deal with. Project is a Latin word that is a very accurate translation of the Greek word problem. Both words have been brought into English and, as is natural, have acquired each its own peculiar shade of meaning. Problem is the word used more frequently in theoretical or scientific discussions. Project seems to belong rather to practical affairs.

In schools, for instance, the word problem has its peculiar use in mathematics, in the laboratory sciences, in the arts. Project is a newer term and came into the schools through agriculture, household arts, and the industrial arts. It has been suggested that problem is the word to use for the intellectual part of the activity while project is the term to be used in describing an activity that ends in some material outward result, like the making of a dress, a chair and the like. No amount of analysis or argument will finally decide which term is to be the common school term, nor just what distinction will be made between them, if both are retained. Usage alone will decide.

It is enough at the present to hold in mind the following: (1) Problem and Project are alike in that they both presuppose purposive activity, or thinking. (2) When we are discussing how we think in order to criticize our thinking, the word problem is the one we naturally use. (3) When we wish to decide the total undertaking in school practice, usage seems to tend to prefer the word project. (4) Every project has a problem within it which makes it what it is. In harmony with these points, this whole discussion is called the Problem-Project Method. This is deliberately done in order to show their fundamental identity. When we shall have occasion to discuss, think, we shall use the term problem almost exclusively, because it is the usual word. Later when examples are given of problem-project teaching in English, geography, history, and the other school subjects, the term project will be used because it is the more common.

### A. INDIVIDUAL THINKING

It has already been stated that a person is individual and social at the same time. Thinking is an individual activity, as we all know. We do our own thinking. Nevertheless, we think with others. What they think helps us in our thinking. Often we have to think with others in order that we may act with them. It is a strange fact that most of the descriptions of thinking found in books on education, seem to ignore the extent to which our thinking is social, that is, carried on in coöperation with others. But it is necessary to understand individual thinking before we can understand social or group thinking. Let us turn then to a description of thinking.

The word thinking has a broad and general meaning and a narrow and scientific meaning. In the first sense, the word covers almost any activity of the mind. If we

say that we are not thinking, we may mean that we are preoccupied, careless, dreaming, or that we are actually thinking of something else. In this loose sense, thinking may be used as equivalent to remembering, recalling, imagining, or any other mental function. In the narrow sense of the term, by thinking we mean reflecting, reasoning. Now the modern students of the mind in trying to tell how the mind works are influenced by the methods of scientific students in other fields.

Modern science asks two great questions in the presence of any phenomenon: (1) Under what conditions does it arise? (2) How does it go on? This is particularly true of the sciences dealing with living things. Formerly great emphasis was laid on the structure of plants and animals, the shapes, parts, organs were studied, described, compared. Nowadays, the great question always in the mind of the student is, What does the plant or animal do? Under what conditions does it do this or that? How does it do it? In a word, modern science studies function first, and structure second and as an instrument or tool with which the function is performed. The modern botanist asks first how the plant feeds itself, reproduces itself and considers roots, leaves, flowers, seeds as means. The modern zoölogist asks how animals move, feed, reproduce, and considers the parts and organs as means.

### How Thinking Takes Place

This method of study that begins with function in order to understand structure has passed over into the sciences that deal with man, such as sociology, psychology, education, economics, politics. In psychology, in particular, the great question is not as to the structure of the mind, but as to its functions. The fundamental position of modern psychology and consequently of education is that sensation, perception, memory, imagination, reasoning are functions of the mind. To explain these functions is to answer the two questions mentioned above, under what conditions does the mind do these things, and how does the mind carry on these functions.

Now this is just what has happened with regard to thinking. Students of logic and psychology, the two sciences that deal with thinking, have answered these two questions. The reply to the first question, under what conditions does thinking take place, is this. Thinking takes place in the presence of a problem. We are confronted by a problem when we cannot go ahead, when we are in doubt as to what to do next. Put in another way, when we find ourselves in a situation where our habits no longer carry us on, we are forced to stop and think. Such a situation is sometimes called a problematic situation. Just here it might be said that the problem may be one that is chiefly mental, as for instance, how to answer a question in an intelligence test, or how to calculate the interest on a sum of money for a given time, or the problem may have a material side, how to get across a swollen stream, how to build a garage, how to make a dress, how to make a radio-telephone. This is why it was said above that at bottom, problem and project are essentially the same.

### How Thinking Goes On

Having decided that thinking takes place in the presence of a problem, the second question arises, how does thinking go on. What do we do when we think? The answer to this question has been worked out in detail in a book by John Dewey entitled, 'How We Think'. Dewey's account of the process of thinking is the basis on which the theory of the problem-project rests. There are five phases of the thinking process that can be discriminated and that are important to observe if we wish to think critically and successfully. The phases might well be called steps, because they have a certain natural order in time. But at best, thinking cannot be reduced to a mechanical system that can be rigidly followed out to a desired result. In proceeding, therefore, to name these five phases, or steps in thinking, let it be noted that they are not actually separate and distinct acts, each of which is or must be completed before the next is entered on. Above all, these steps should not be reduced to a hard and fast formula of procedure in teaching or directing the work of children. They are, however, the actual steps taken in the solution of problems in the world of science, industry, and practical life. As such they can and should be recognized and used as a means of organizing one's procedure in individual and group work. These steps in thinking are: **Experience; Problem; Data; Solution; Application or Test.**

### Steps in Thinking

**1. EXPERIENCE.** It has already been stated that the first great question that is asked about thinking is, under what conditions does thinking arise; and that the answer is, thinking arises in the presence of a problem. Accepting this answer to be correct, we can push the inquiry back one further step and ask, where does the problem come from? The answer is very simple, it arises within our experience. This is a very important fact to be held in mind. Real thinking can take place only in a real situation. We can repeat the outward form of others' thinking without thinking ourselves. To do so is to imitate others, to reproduce the acts of others. Such repetition or reproduction may force us to memorize the language of others' thoughts. This we may do with great accuracy and detail. But after all we are not thinking thereby, but merely recalling or reciting.

Thinking is like swimming. It is an activity that presupposes a particular kind of environment. We may take swimming lessons of a good instructor who may teach us certain movements of our arms and legs. We may learn to make these movements in a definite order according to definite count. But at last there comes the time when we enter the water and attempt to keep our bodies afloat and to make progress in the water. Then and then only do we swim. We do not need to be told whether we actually succeed in swimming or not. The position and movement of the body, the feel and resistance of the water, the pull and thrust of the arms and legs against the soft and yielding water, the final sense of floating under our own propulsion comes as a revelation that we have succeeded. We can swim. So we think and learn to think.

### New Experiences Develop Thinking Power

We must have experience of a sort to make us think. There is no difficulty about our having to and learning to think outside of school. Life in the home, on the playground, in business provides us with experiences that are full of problems. We solve those problems the best we can. We learn from others what they have to offer, we try, try again, we recall all that we have experienced before, we imagine some way out of our difficulty, and we persist until we succeed or abandon our purpose. The whole process is taken for granted, is very real, and is a welcome challenge to our whole nature. The whole point

is that life itself is just one continuous developing experience full of problems that are real to us and that demand solution from us, and that provoke us into the forming of purposes and plans which we use all our resources to carry out to a successful issue. We begin to think in a simple way very early in life, just as we taste and feel, remember, imagine, and the like. We think before we know how to think, if by knowing how we mean that we can give an acceptable scientific account of our procedure.

We all know how important new experiences are to make us grow in power to think. New playmates create a social situation that presents problems of adjustment. We have to learn how to get along with others. If we are born in the city, a transfer to the life of a farm overwhelms us with problems. New activities, strange animals, processes of preparation and cultivation of the soil, of planting and harvesting, new tools, the driving and care of horses, the feeding and milking of cows, all the life of the farm constitutes a new world of new problems which arouse our interests and direct and develop our efforts.

If we go to work in the city in a factory or a business house a very similar thing occurs. We are brought into contact with new activities, with new furniture, utensils, machinery. We see new things made and have our part to play in the making of them. We find that we are awkward and unskilled. We do not even know the names of things and what they are for. The new experiences make us think. We grow in the new situation. We realize that we are undergoing change and becoming different. So also with travel. A new physical environment, different scenery, strange costumes and speech, new pursuits and processes, all force us into new ways of thinking. And so the law holds good—new experiences, new problems, new thoughts. Right at this point it is important to recognize a distinction of the greatest significance for education and teaching. This distinction is between direct and indirect experience.

### Direct and Indirect Experience

Direct experience is experience of a thing or situation as present. Indirect experience is experience of a thing or situation as represented or communicated by others. Direct experience is our own and we can tell others about it. Indirect experience is borrowed from others. A great many things might be said about these two kinds of experience, if it were important to attempt a complete treatment of them. The vital thing is to have the distinction once clearly in mind. Further elaboration of it will be easily made by everyone.

Direct experience is the necessary foundation of all indirect experience. Indirect experience is built on our common direct experiences. Direct experience has a reality, a degree of intensity, that it is difficult to secure in indirect experience. To be told about a thing is interesting and valuable, but it is not seeing it for oneself. The more we read about the Grand Canyon or Niagara Falls, the more pictures we see of them, the more anxious we are to see them. And when we do finally see them, they are strangely familiar and at the same time absolutely new. We have no doubt at all that they are seen for the first time. On the other hand, if we travel much and become familiar with cities and costumes we become increasingly able to form a picture of a city that we intend to visit so that when we are actually present in it we may say to ourselves that it is just what we expected to see.

What is thus true of travel, holds good in science, industry, commerce, and the professions. A physicist in America reads of an experiment carried on in a laboratory in Europe. He has enough direct experience in this subject so that he can understand a written account of the experiment. He goes about setting up the apparatus in accordance with the description and as a result gets a new, direct experience. A manufacturer reads of a new process of making steel, a new way of packing goods for shipment, a new way of organizing his business, and on the basis of this borrowed experience, he proceeds to get a new direct experience. A surgeon reads in the journal of his profession of a new method of operating and changes his procedure in like cases.

### Mingled Effects of Experience

In the actual conduct of our lives, direct and indirect experience play a varying part. One might hasten to the conclusion that indirect experience, being gathered from others and thus less real, would have less influence on our conduct. But this is not always the case. It is what we do not see, do not know, have not yet undergone, that often has the greatest hold on us. This is why we are so often the sufferers from fear and worry. We see others in poverty and we begin ourselves to have the feelings of the poor, although we are well supplied with all the necessities of life. We read of people perishing on the sea and we are afraid to take a ship to Europe. We read of a bank failure and we hide our money in a stocking. The partly known is effective just because it is but partly known.

Our experience then is a strange medley of the direct and indirect. Some things we know and others we know about. But we cannot stop with this distinction. We must know just what function these two forms of experience play in our lives. Direct experience is founded by the limitations of space and time. It is as wide as our movements permit it to be and as continued as our life. If we live in a narrow spatial environment, travel little or none, and are in a simple primitive community, we gain a very intensive experience within these limits. But we remain local and provincial in our ideas and practices. If on the other hand we travel much and observe carefully, our mind and our conduct are enlarged and liberated.

Were we to be restricted to what we can directly experience, even if we did travel, we should still be narrow and ignorant, were we not able to learn from others. For the real explanation of what we saw would be withheld from us.

Beautiful buildings, railroads, steamships, telephones, monuments, business blocks, social customs, business methods, law courts, churches, schools, all have a history that must be learned from someone else, if they are to be understood and valued aright. The result is that while we do inevitably have an inner circle of direct experiences in time and space, it becomes increasingly difficult for us to be intelligent and wise within that circle unless we can draw on indirect, borrowed, communicated experience for explanation and enlargement of our direct experience.

In primitive times when men lived in separate tribes, it was easier to live a complete life of direct experience. Today the world is all of one piece. Clothing, machinery, foodstuffs, luxuries, objects of art are sent from one part of the world to another. We communicate with one another across the continent and over and under the

seas. Nobody can understand his own little home world without taking into account the whole world of today and of yesterday. So our experience, to be rich and full and under our control, must be an intermingling of direct and indirect experiences.

### A Necessary Relationship

But these two forms or kinds of experience nave a relationship one to the other that is vital and fundamental. Indirect experience can be communicated only when the elements of such experience are already in our possession as direct experience. If one had no experience at all of hot weather, luxuriant vegetation, tropical fruits, strange animals, it would be difficult to build up in his mind an idea of life in the tropical countries of South America. If one had no experience at all with machines, it would be difficult for him to profit by a careful description of the mechanism of an automobile.

It is a fundamental fact, therefore, in life, and it should be a fundamental principle in educational procedure, that a rich fund of direct experience is necessary to enable one to appropriate and use the inexhaustible treasure of indirect experience available in books, magazines, newspapers, and pictures. We can only learn what we in some part already know. On the other hand, indirect experience is of value to us only as it helps us to understand and control our own direct experience. Much that happens to us has its origin and cause outside our own range in space and time. The tropical fruits that we eat, the machinery that we use, the markets for the goods we help to make, the coal that we burn, the clothes that we wear, the music that delights us, the government that protects us, the sciences and literature that guide our intelligence and sustain our spirits, all presuppose a world beyond our reach in time and space. This outside world creates, sustains, and interprets our own narrow world. Thus these two forms of experience are not separate and independent, but are fused together in the very processes by which we build up our world of facts, ideas, purposes, values, and efforts.

### Important Point in Education

The great problem of education as the science and art of controlling the growth of the young is to organize the life of the school so that indirect or communicated experiences may really unite and fuse with direct experiences. It is a problem of making the school simulate life in this fundamental respect. The out-of-school life of children may be too narrow and limited, or it may be too confused and distracting to favor a broad and continuing growth. But it has the advantage of being real, direct in its appeal, and full of problems. The school, by its very nature, has the disadvantage of withdrawing the children from the rich life of the society which produces them.

For many years it was the accepted theory and practice of the school that its chief business was to give children the means of communication and communicated experience. The assumption was that once the experience in the symbolic form suited to adults was reasonably well fixed in the minds of the children, the school's work was done. The indirect experience was supposed to remain in reserve, ready for use at some time when it would be needed. It would be untrue and unfair to assert that the school did not do better than it planned and thought. Sometimes it did better and sometimes it did worse. The trouble was that on its own theory it could only succeed by accident. Where the work of the school was carried on in connection with an interesting and real life outside, the children achieved the connection between their school work and the work outside. If they failed to do so, no great harm came of it.

The problem of the modern school is much more complicated and difficult. Life in and out of school is much more complex and the task of the school has been greatly increased in scope and extended in time. It must have a theory and practice that makes success possible. The application of what has been said to the conduct of the school, to education, to teaching may be summarized as follows:

a. Thinking is problem-solving.
b. Problems arise within experience.
c. To give children problems means to find problems that are within their experience, or to provide them the experience out of which real problems arise. This means that the teacher must treat the out-of-school and the in-the-school life of the children as one continuous whole.
d. Indirect experience must be given children to help them solve problems growing out of their direct experiences.
e. The problem-project method aims to teach children to think by dealing with problems found within or introduced into their experiences.

**2. PROBLEM.** It seems unnecessary to attempt a definition of a problem. It is clearly something to be wrestled with, to be attacked, to be worked out. In ordinary life we seem to run into problems, we are confronted by them. We do not hunt them out, they meet us on the way. In terms of consciousness, they represent suspended action; we can't go on until we do something and we do not know what to do. For this reason, it is often said that problems arise when habits no longer enable us to deal successfully with our environment. Where established habits function satisfactorily, no problem arises. It is easy to see, then, that problems arise either from change within ourselves, or in the world outside ourselves with which we have to cope. There is no difficulty, then, in seeing where problems come from. We change, we grow; new desires, new talents, new capacities, new responsibilities are always entering into our lives. Even our successes and achievements raise us to new levels from which we can see new difficulties and new opportunities arising before us.

Confusion is likely to arise in the discussion of the problem due to the use of the term to cover two distinct aspects of the problem situation. These two phases are **the problem presented,** and **the problem formulated.** A word or two may serve to make the distinction clear and assist in the application to the teaching process.

### The Problem Presented

When we say that thinking arises in the presence of a problem, we are concerned to make clear the characteristic conditions under which all thinking takes place. We then proceed to indicate, as above, that such a problem implies change within us, or the environment, or both, as the result of which we are made conscious that we cannot act as we habitually do, that our desires are thwarted, and that we must do something about it. In the discussion of the problem-project method, we should be careful to recognize that this use of the term problem is the broad one, and that to it the whole thinking process should be related. In this situation, we are led to define

to ourselves what precisely we want to do under the circumstances. This effort at definition leads us to—

### The Problem Formulated

Of course this effort at definition or formulation is not a matter of a single act. All through the steps of the thought process that we are attempting to describe, there continues to be re-definition and re-formulation as we know more what we can or cannot do. The point is that at least a tentative definition or formulation does take place. This step corresponds to purpose forming, choosing of an aim, selecting an objective. When we say that thinking is purposeful activity, we are describing the whole process by using a term fitting this stage of its evolution. There is no synonym for the first use of the problem as just described, i.e., the problem presented. The synonyms for the problem presented are purpose, aim, end, objective, project. Such a problem, purpose, or the like, is simply a foreseen result, something that we want to bring to pass.

For teaching, the vital consideration again is that the problem presented must be within the experience of the children and that the problem formulated must in some real way appear to the children a desirable purpose, aim, end, objective, or project. It is at this point that educational procedure should profit by a very fundamental distinction. A problem to provoke thinking must be the child's own problem. That means that it must be related to his own experience. It must grow out of his own desires and interests. It must fit his situation. But just what does this mean? When is a problem a child's problem? The answer is, when he adopts it as his own.

The teacher creates the conditions under which the children live in the school. These conditions are not merely the physical environment of desk, laboratory, books, and the like. Nor do they consist merely of the social organization and activities of the classroom group. The teacher is a part of the environment for the children, as truly as the mother is a part of the environment of the home, or the office manager of the office. The teacher not only creates but helps to interpret the school environment. The teacher's function is twofold: first, to create a situation affording real experience involving real problems for the children; and second, to help by suggestion to define and formulate the problem, purpose, aim, end, objective, project, so that the children will adopt it as theirs, identify themselves with it. The danger here is that the problem or purpose will be dictated to, or imposed on, the children.

### The Value of Originality

This is the fine art of teaching, to suggest problems and purposes in such a way that the children choose them because of their inherent relation to their own lives. In order that children may work at their own problems, it has sometimes been assumed that the children themselves must discover and formulate, must really originate, the problems themselves. Children outside of school and adults in social life originate very few of their own problems. They are set for them by their leaders in the coöperative enterprises in which they are engaged. They are suggested to them by what others say and do. No matter where a problem or a purpose comes from, it is mine when I make it mine. To leave it to children unaided to invent and originate profitable problems in school is as unnatural and foolish as it is in out-of-school life. If the school life is continuous with out-of-school life, if it enlarges and interprets the children's experiences, the children and teacher together will recognize and define the problems to be solved, the purposes to be achieved.

**3. DATA.** The third phase or step of the thinking process is to survey the situation to find what resources are at hand for solving the problem. Having defined to some degree what we want to do, we look about us to discover what we have to do it with. The Latin word *data*, which means "the given," is used to indicate facts, evidence, material, with which one begins the solution of a problem. That is the meaning in which it is used in this discussion. "Data" means anything or everything that is available for solving a problem. This meaning of the term permits a very wide application. Data may be ideas, facts, tools, stones, native powers, acquired skills, reputation, prestige, money, credit, anything and everything in human life. Data, however, are always such for a particular problem. One could never tell what to regard as data, save as one kept in mind what problem he was seeking to solve, what purpose, aim, end, objective, project, he was trying to carry out.

This is just the significance of this phase, or step in thinking. One uses his problem, or purpose, as the searchlight, as it were, with which he surveys his whole experience, past and present, to learn what he has available to use in solving his problem. The drowning man clutches at a straw because that is all he can find. So in practical life we mend clothing with nails or pins when buttons and needle and thread are not at hand. The simple processes of problem-solving in the home, on the farm, in the workshop are the same in kind as those of the scientific laboratory. The latter are more difficult, perhaps; require more refined thinking and analysis, but they differ only in degree. This explains why the expert in the field is the one who makes the discoveries and takes the new steps. He has more data with which to work. The application of all this to teaching in the school is manifest. The data which are available are not known even to adults, when they first start to solve a problem. They must "look it up," as the saying goes. Where does one look for data in every-day life? At home, one asks parents and elders. In the world of business, it is the superior, the more experienced to whom one turns.

But above all, there is the world of books. One of the greatest services that can be rendered a child as he goes through school is to teach him that there is a whole world of knowledge already organized for his use in books and libraries. But the act of hunting for the data, the "looking it up" is the educative experience. What a pupil learns in any case might be given him outright by his teacher. But the knowledge thus gained would have only the value of the fact itself. To "look it up" oneself is to get the notion that problems are soluble and to develop the initiative, persistence, and sense of personal responsibility which result in independence and self-reliance. The problem-project method of teaching, if carried on in the genuine spirit of research and inquiry, will produce a type of educated man and woman that will face forward, will think their own way to the solution of problems, and will be above the influence of mere habit or custom.

**4. SOLUTION.** The fourth phase, or step, in problem solving is the setting up of a probable or possible solution. This is, of course, the crucial activity. If the problem is fairly defined, and the data are surveyed to see what can be utilized in the solution, the solution itself is care-

fully thought out. To think of a solution is an act of the imagination. One has to hold the whole situation before the mind's eye. Here is the problem to be solved, here is what one has to work with, the data or means, here is what one can do with the data to work out the problem.

Here again emphasis must be laid on the fact that these steps are not separate in time, nor can they be separated in thinking. My problem must be clearly before me if I am to recognize what among my innumerable resources, inner and outer, are possible data for this particular problem. At the same time, both problem and data must be held before me as I try to think out the solution. With the data or means at hand, only such and such a solution is possible. The solution that is finally hit upon is not made out of nothing. One thinks of similar situations in one's past experience, one recalls or learns how others have gone about solving similar problems. Great inventive and creative minds seem to have unusual power of working out solutions that often seem very simple once they have been worked out.

The educational significance of this phase of the thinking process is fundamental. Whatever the teacher does to provide experiences involving problems, to help detect, define, and choose the problem to be solved, to furnish and stimulate the search for data, the greatest skill will be required to suggest possible solutions, or part-solutions, without giving outright, the solution. The children should be permitted, led, urged, and helped to work out their own solutions. This is the very essence of thinking, it is thinking. The experience, the joy of doing this work for oneself is the best training in thinking and the best guarantee that one will continpe to think for himself. Before leaving the discussion of this phase, or step, let us note that the synonyms for "solution" used in discussing thinking, or the problem-project, are two Greek words, "theory" and "hypothesis."

**5. APPLICATION OR TEST.** The fifth phase or step in the solution of problems in thinking as a phase of experience is to put the solution, theory, hypothesis to a test. So far the solution is one only thought out. It must now be acted out. To test a solution is not to apply some external means to it, as one tests acids by litmus paper, or starch by iodine. The test of a solution is to do what the proposed solution called upon you to do. Perhaps a better word would be to execute it, that is, carry it out. Your solution, theory, or hypothesis, always has essentially two parts. If I do this and this, then this and this will happen. To test, or apply, or execute the solution, you just do this and this. If what you thought would happen, does happen, your theory, solution, hypothesis is true, you have solved the problem. If what you thought does not happen, there is left for you only the return over the whole process again with the added knowledge gained by the whole experience. You define the problem anew, add or reject data, modify your solution or theory until you get one that will work out in practice.

## B. SOCIAL THINKING

Thus far thinking has been treated as if it were an individual matter. The conditions under which an individual is led to think and the steps or phases of the thought-process have been named and described. At this point it should be emphasized that although an individual does his own thinking in the way set forth above, his thinking is not merely individual. The occasion of his thinking, the material, data, and results of his thinking are all affected by the activities of others. Life is all of a piece. Our activities, our purposes, our feelings, our desires are but phases of our coöperative enterprises with the world of people about us. In the home, at school, in the business world, in science, literature, and art, we are always dealing with a world that others have constructed and others are now maintaining. If we are going to carry on our own enterprises and solve our own problems, our thinking must constantly deal with what other people are thinking and doing. We must fit our plans into the plans of our parents, our teachers, our leaders.

### Group Activity

The great outstanding fact about the life of people is that it goes on in groups. The family, the school, the church, the business organization, the city, the state, the nation are groups of people who commonly work together for certain purposes. Some of these groups are stable and persistent. Others are temporary. But whether the group be hastily organized or of long standing, the fact that makes it a group is that the people who form it have a common, a group or social mind. This means that they have common experiences, common ideas, common ideals, common customs, habits, feelings, desires, and purposes. These they get by living under common conditions. In order to act together as a group, they must have common purposes to carry out. They get these common purposes by the processes of communication, by language spoken or written, by the printed page in the form of books, magazines, and newspapers, by the telegraph, telephone, wireless, and radio, and by travel from one place to another.

A group may be as large as the existing means of communication permit it to be. The United States of America is a very large political group. It can act almost as one man, although it has one hundred twenty millions of people in it. It can do so because in the main the people use one language, read the same news and books, and because the material means of communication such as railroads, telegraph, telephone, and the like are so highly developed. This ability to act in coöperation to achieve a common purpose was demonstrated during the great World War. A group has been defined as a number of people acting under a common purpose. If we go back to our description of thinking, it is easy to see that group thinking, like individual thinking, is just purposeful activity on the part of a group. Purpose, then, is fundamental both in individual thinking and in group or social thinking.

### The Socialized Recitation

The socialized recitation is one of the newer methods of conducting the work of teaching. The problem-project may be an individual project, or a group project. When it is a group project we have a socialized recitation. It would be simpler and better therefore to abandon the term socialized recitation and use the term group-project. But since the former term is in use, it is wise to recognize its real nature. The essential things to be observed in using this form of class-room procedure are **Group Purpose; Division of Labor; Group Test.**

**1. GROUP PURPOSE.** A socialized recitation is at bottom but a carefully planned and organized and executed group project. The essential thing about it, therefore, is to start with a group problem or purpose.

All that has been said about the source of the problem above applies here. The common problem, purpose, project may come naturally from the previous work of the group, may be suggested by one of the pupils, or by the teacher. The essential thing, again, is that the purpose be not dictated to the group by the teacher, but should be adopted by the pupils as their own. This latter result can be brought about in various ways, by formal vote, by consensus of opinion, or in any way that a group would be led to make up and express its mind. From the standpoint of effective teaching, the prime requisite is that every member of the group should be brought to understand clearly what the purpose, problem, project is. Since it is a group problem to be solved, the next step to be taken is to work out carefully a division of labor.

**2. DIVISION OF LABOR.** The group project, problem, purpose can be accomplished only as all the members share in the work. It is just this sharing that makes the work educative. The members of the group, under the suggestion of the teachers, should themselves divide up the work. So far as possible each one should be allowed to undertake the part he wishes to have in the enterprise. The interest of the whole group as well as of each member depends on the skill with which this division of labor is accomplished. Each member now has an opportunity to exercise initiative in finding data that are presented to the class and in suggesting solution to the problem. The group then assembles, criticizes, and evaluates the contributions in the form of data and solution presented by each member. Here lies the opportunity for oral and written report, argument, criticism, and suggestion. This whole process of coöperation should end in a final group test.

**3. GROUP TEST.** Just as the group problem must be carefully set forth and recognized by each member of the group, and as each member must have his own share in seeking a solution of the problem, so the whole group effort must end in a definite approval and appreciation of the result reached by the whole group. A definite time and program should be arranged for this final test. The group work should find unified expression. This may take the form of a public program, an exhibition, the formal adoption of a written conclusion, the printing of such conclusion, in any and every way in which a school group may find it possible to bring to its own consciousness that as a group it has reached a definite result. A comparison of the procedure in individual thinking, or problem solving, will make it clear that the socialized recitation is but the formal carrying out of a group project in the course of which each member of the group works out his own individual project.

# The Problem Method in Geography

By FREDERICK K. BRANOM
Geography Department, Chicago Normal College

GEOGRAPHY has passed through several stages during its growth and development in the United States. During the early part of the past century, many of the geography textbooks were little more than "Geographic Catechisms." Gradually description crept in and geography came to be known as the study of the earth and its people. As long as this meaning was held, geography consisted of a mass of material, much of which was unrelated. It consisted chiefly of the location of places and the memorizing of facts. Fact after fact was presented in almost the same way. Children were supposed to be walking encyclopedias and they learned to locate places, many of which they would never have any occasion to use after leaving school. Memory work was encouraged because it was thought that children had better memories than judgments, and it would be a waste of time to have them think out solutions.

### The World War and Geography

A few years before the World War, mention was being made of the "new geography" and the "Why" element was showing on the horizon. Our relations with foreign countries had been growing stronger each year, but how strong no one realized until the World War broke forth. Then we awakened to the realization that the United States is connected rather closely with the rest of the world. People began to look for reasons why the United States, which is 3000 miles from Europe, could be affected so much by the war. Geography gave the answer, for it was learned that the United States owes its importance not only to its energetic people, but to such geographic factors as climate, physical features, resources, and location. Further study showed that nations are related so to one another in trade and commerce that when the arteries of commerce are closed or a serious calamity happens in one or more countries, the other countries of the world are affected in a greater or less degree.

Today, geographers are looking over a new horizon, for it is recognized that geography treats of man in relation to his physical environment, not only man in the United States, but in all parts of the world. Geography shows that human beings similar to us inhabit the earth. It shows that people all over the world, whether they are in the hot moist regions of Africa or on the prairies of Illinois, have some problems in common. By knowing that the regions of the earth may differ from one another in respect to climate, physical features, resources, and location, it is understood readily why people living in such regions may have various aims and ambitions. Thus wars will tend to disappear and commerce will flow uninterruptedly.

### Aims in Teaching Geography

Through education, the individual learns how to adapt himself to his various environments so that he may become a better social being. Geography, in treating of man in relation to his physical environment, occupies an important position in education: Some of the common aims which every teacher of geography should have are:

**(1)** To cause the pupils to become citizens of the world by giving them a sympathetic understanding of the peoples of the world.

**(2)** To show how geography affects the problems of life, why man works, how he works, and where he works.

**(3)** To show how man depends upon the earth for a living and to show some of the economic problems which he faces.

(4) To give the pupils a knowledge of the location of the chief places of the world such as rivers, lakes, oceans, cities, and mountains.

(5) To show how the natural resources may be used to the best advantage, to predict, whenever possible, the future possibilities of a region.

(6) To teach the pupils how to solve problems and how to use their knowledge in new situations so that they may work independently in later years.

(7) To teach the pupils how and where to find materials and information, how to use such helps as books, pictures, maps, graphs, and museum materials.

(8) To teach the pupils to have an interest in everyday affairs, to enjoy the beauties of nature and to spend their leisure time in profitable ways.

(9) To apply geographic principles so that the pupils may understand the growth of leading cities, the development of important industries, and the interdependence of nations.

(10) To lay a foundation for the study of geography in later years and for making an honest living.

### Problem Solving Versus Memory Work

In order to fulfill the aims of geography, the task of the teacher is to see that the material is presented in the best way. Various kinds of lessons have been used, but the one that seems to have the most promise is the problem method. A problem in geography is a unit of activity with a well defined worth-while objective and it is carried to completion usually by a series of minor problems. (This definition is given sometimes for a project, but in this article we make no attempt to distinguish any difference between a project and a problem.) By using the problem method, pure memory work gives place to reflective thinking and the pupils learn to reason for themselves. However, a good memory is not to be disregarded, because in reasoning past events must be recalled. Hence a teacher or a pupil should not think that nothing should be remembered. The fact is that in reflective thinking, where the pupils reason out things for themselves, much will be remembered and will be ready for use in solving other problems.

### Problem Solving in Regional Geography

Since the problem method is a unit of work, it well is adapted to regional geography. Until recently, political geography was the chief kind of geography taught in our public schools. Each state or country was taken up separately in about the same way, with very little regard to any other state or country. The result was that geography was taught usually by a standard outline which included location, area, climate, surface, soil, drainage, natural resources, plant and animal life, and human life. When the last topic was finished in the outline, the pupil had an idea that he had done a very thorough piece of work.

Today, regional geography has largely taken the place of political geography. States and countries still are studied, but in relation to the region to which they belong. A geographic region may be said to have (1) essential unity in physical environment, (2) essential unity in human response and human activity, and (3) essential unity in density of population. Whether a large number of geographic regions of the earth will be made depends largely upon the age of the pupils. In the grades, the number of geographic regions for a continent, such as North America, will be small, while in a college the number should be larger. In both cases the students are studying regional geography, but because the college student is more advanced he will be able to make finer distinctions.

### Rules for Determining a Problem

If a geography teacher is going to use the problem method, he must know how to determine suitable problems. A great many problems arise in the classroom, just as in life, that need not be answered. Since there is only a limited amount of time for geography, the teacher must see that only the best problems are taken to be solved by the pupils.

Some of the rules which a teacher may apply in deciding whether the problem is appropriate are: (1) Is the problem of enough importance for the class to take? Will it bring out minor problems and projects which will interest the pupils and will it develop the pupils along the right lines of thought? Will the conclusions reached be worth while and may they be used in solving other problems? (2) Is the problem adapted to the pupils or is it too difficult or too easy? (3) Is this the grade in which the problem should be taken? (4) Is there plenty of material which the pupils may obtain in solving the problem? Occasionally worth-while problems may arise which will have to be cast aside on account of lack of material. (5) Is the problem stated so that it will bring out what is intended? (6) Is the problem one which may be completed in a reasonable amount of time? Do not teach the pupils to become careless by leaving things undone. (7) Is the problem one which will give the pupils a more sympathetic feeling for all people and thus show the interdependence of all nations? Does it fulfill the aims of geography?

### Raising the Problem

A geographic problem may be raised in a number of ways just so long as the pupils feel that it is their problem. In some cases the teacher may assign the problem. If the pupils immediately enter into it, this is sufficient. Sometimes the teacher assigns the problem and then discusses with the pupils certain material which shows the need of the problem. At other times, the pupils and the teacher discuss certain topics, and a problem arises and is stated by the pupils in place of its being stated by the teacher. Again, the pupils in their outside reading and activity may find a problem which they want to answer. When they come to the geography class they may be so enthusiastic over their problem that the whole class may wish to solve it.

Current events will sometimes furnish the problem. Newspapers and magazines publish much geographic material which may be used in the classroom. By using current topics, the pupils are led to see that the life in the schoolroom is related to the life outside the school and that they are solving real problems. For example, a class had finished a problem and the teacher was thinking about what problem to take up next. However, the children found the solution. When the class began the next day, one of the pupils had a clipping which told about a meeting being held which discussed the proposed Great Lakes-St. Lawrence Waterway. The clipping was read, and since the pupils lived in the territory near the lakes, they became much interested. Numerous questions were asked and soon the problem was raised: "Of what benefit to the United States and Canada would be the Great Lakes-St. Lawrence Waterway?" Since the problem covered work which the pupils were supposed to have during the year, and since it was

a live subject which will be before the American people for some time, the teacher gave his approval and the class spent several profitable weeks on its solution.

### Stating the Problem

The problem may be stated in a number of ways. It may be **(1) a question,** as, "What has enabled Chicago to become the second largest city in the United States?"; **(2) a debate,** as, "Resolved that the United States should develop its waterways"; **(3) a scoring lesson,** as, "To find out whether Canada or Mexico has the better opportunity for future development"; and **(4) a declarative statement,** as, "Why China must become an important country" or "To show why the trade of New York is greater than that of San Francisco."

Likewise the problems may be selected which will account for past conditions such as: "Why did most of the American settlers stay near the Atlantic coast until after the Revolutionary War?", or "Why did civilization develop at an early date in the valleys of the Tigris and Euphrates rivers?" The problems may treat of present day conditions such as, "Since the area of New England is so small, why is it such an important manufacturing region?", or "Account for the sparse population in the Amazon valley." The problems may deal with future possibilities such as, "Will the population of Chicago ever surpass that of New York?", or "Will the hot moist regions ever become densely settled?"

### Work of the Teacher

After the problem has been selected by the pupils the work of the teacher only has begun. To be a first class teacher of geography, a teacher must have the true vision of geography. He must understand what he is teaching and he must make his work a part of himself. He must have the power of so leading the pupils that they will feel as if they are exactly seeing the things about which they speak. It is one thing to draw an outline or to make a rough sketch of a region, but it is another thing to feel as if the picture is real. In drawing a map of a region, the pupils should see in their imaginations the things which they would see if they were actually in the place represented by the map.

The teacher should know his subject thoroughly. He should know where references of various kinds may be found and he should be ready to meet all problems which may arise. All materials such as maps, museum material, pictures and graphs should be listed so that they may be turned to at a moment's notice. The teacher should know when to help, for sometimes a few well chosen words at the right time will do much in aiding a pupil.

When necessary, the teacher may aid the pupils in the following ways: **(1)** He should make sure that the problem is stated so that the pupils understand it. Then there will be no excuse of "I did not understand it." **(2)** The teacher should see that the problem is kept in mind. Pupils are human beings and their attention may be deflected from the problem. It may be written on the board and at times doubtful pupils may repeat aloud the problem. **(3)** The teacher may help the pupils in analyzing the problem. Past experiences should be recalled by the pupils and new material collected. All pupils should take part but it is not necessary that all should do the same work. Such projects as posters and maps may be made. Minor problems may arise and projects may be undertaken by the pupils. If desirable, an outline of the progress made day by day may be put on the board. A suggestion here and a word there, given by the teacher, may benefit some uncertain pupil at the right time. It is here that the supervised study lesson is used. With the pupils hard at work under the direct supervision of the teacher, much time is saved and the pupils learn correct habits of study. **(4)** The teacher should aid the pupils in coming to conclusions. All material should be weighed carefully before being accepted. A pupil should be led to see the value of constructive criticism and of having an open mind. Only after much reflective thinking should a pupil make up his mind on any important problem.

### The Value of the Socialized Lesson

In solving geographic problems, the socialized lesson finds its great use. In a socialized lesson **(1)** the pupils do not do necessarily the same work. The class may be divided into groups and each group do independent work in solving some part of the problem. Each group reports to the class as a whole and when all the groups are through reporting, the pupils are able to make up their minds concerning the problem. Sometimes a pupil may be chairman and the teacher will take part only when necessary. **(2)** In a socialized lesson the pupils enter into the discussions in a democratic way. No one is permitted to monopolize the recitation or to do all of the work. It is here that the pupils are taught to respect the rights of others. Initiative, leadership, and self-dependence are developed. **(3)** In a socialized lesson all pupils may not do the same amount of work. Each pupil does as much as he is able to do and he is made to feel that what he does is worth while. **(4)** Socialization requires that a pupil should have the opportunity of asking questions and of raising problems. In the old time classroom, only the teacher asked questions and the pupils answered them. Today we think that it is good teaching if the pupils not only answer questions but also ask intelligent ones. Likewise many believe that problems and topics for discussion should originate with the pupils.

In order to illustrate and to make concrete what has been said, three problems are given.

### EARLY GRADE PROBLEM

**Learning to Tell Directions and to Read a Map:** The teacher took her fourth grade beginning class to a small park near the school. In going to and from the park the pupils noticed in what direction they were going. They learned the names of the streets and in what directions they ran. Some of the homes of the pupils as well as other things of interest were pointed out and their directions noticed. On reaching the park, the pupils observed such things as the tennis courts, the playgrounds, the ball diamonds, the bathing pool for children, the building which contained the branch public library and the assembly hall, the shrubbery, the flowers, and the trees. While in the middle of the park they had a pointing game. Their attention also was directed to the sun and they noticed where it was.

When the children returned to the schoolroom, they were bubbling over with information and they wanted to show their journey on a picce of paper. For several days, the map idea grew. A large piece of white paper was put on the floor and the children traced their routes to and from the park. The schoolground and the park were drawn at the opposite ends. Names of some of the things which the children noticed were put on the map. Cross streets were put in. Since a few of the children lived on the streets represented on the map, they were permitted

to mark the sites of their homes. At the north end of the map the word north was written, at the south end was written south, at the east side was written east and at the west side was written west. The teacher was careful to see that the words were written so that when the map was hung later on the wall, the words would be in the correct positions.

By this time the rest of the pupils wanted to draw maps showing where they lived and this paved the way for making a small map of the neighborhood. Each pupil was given the street on which he lived to put on the map and he located his own home. Sometimes several pupils had the same street because they lived on it. As the map grew, places near the school were located. Many pupils, not contented with a group map, made maps of their own.

The pupils put in practice what they had learned in the geography lessons which followed. Throughout the year, the pupils observed the sun at certain periods of the day and they soon began to associate directions with the position of the sun in the heavens.

## SIXTH GRADE PROBLEM

**Where Does Our Silk Come From?** This class had been raising some silk worms for their nature study work. The pupils were very much interested in the silk worms until they began to spin their cocoons. Then their interest in the worms began to vanish and they became curious to know something about the silk which the worms were spinning. Some one suggested that it must take many worms to spin enough silk for a yard of cloth, many of the pupils began to question where so many worms could be found, and some one asked where the United States obtains its silk. Finally the pupils decided to take as their problem in geography, "Where does our silk come from?" Research work was on in earnest.

### Learning Where Silk is Produced

Each of the pupils made a graph showing the amount of silk produced by the leading silk-producing countries which are Japan, China, France, and Italy, Then the problem arose why Japan and China produce more than two-thirds of the silk of the world. The pupils were put into two groups and one group took Japan and the other group took China. They found out that the mulberry tree does well in these countries due to a warm moist climate, and that at least two crops of leaves may be gathered annually. They learned that since only one-sixth of Japan is level enough for agriculture, mulberry trees are raised on the slopes of the mountains. They discovered that there is plenty of cheap labor, furnished chiefly by girls and women. Chinese and Japanese life and manners were discussed and the pupils brought out many things about climate, surface, transportation, resources, and homes.

After the groups got through reporting on Japan and China, they took up France and Italy. Among the minor problems developed were how Pasteur aided the silk industry in France and how France and Italy have a difficult time in competing with the cheap labor in Japan and China.

Other regions which produce silk were studied briefly.

### The Discussion of Silk Manufacture

After seeing where the silk is produced, the pupils began to study what is done with it. Graphs were made showing the amount of silk imported by the United States from the chief silk producing countries. Several problems in arithmetic were solved. It was learned that the United States receives most of its silk by way of the Pacific Ocean from Japan and China. One boy brought in a newspaper clipping telling about a silk train going from Vancouver to New York with the right of way over all other trains. The reasons why most of our silk goods are manufactured in New York, New Jersey, Pennsylvania, and Connecticut were developed.

In a similar way, the pupils discussed silk manufacturing in Japan, China, France, Switzerland, Germany, Italy, and the United States. One of the children brought to class an article from a magazine about silk stockings being made from artificial silk, so a brief discussion was held on this topic.

Pictures, reference books, maps, and graphs were used throughout the discussions. During the study periods and the recitation periods the pupils had taken notes and written short compositions, so when the work was ended, they collected their papers in a logical manner and had a small pamphlet on silk. The pupils collected and arranged a silk exhibit of their own.

The last day was spent by the teacher and the pupils in seeing that they had the important points which had been developed in the solution of the problem well in mind. No problem should be left without a review of the important factors entering into its solution.

## UPPER GRADE PROBLEM

**Why Does the United States Produce Three-Fifths of the Cotton of the World and What is Done with It?**

I. **Raising the Problem:** What are the common articles from which our clothing is made? Which is the most common? On a blank map of the world color the regions producing cotton. Make a graph showing the yield of the leading cotton producing countries.

II. **Problem Raised:** Why does the United States produce three-fifths of the cotton of the world and what is done with it?

III. **In the Solution of the Problem Many Minor Problems Arise:**

- **A. Where in the United States is cotton raised?**
  - a. On a blank map of the United States color all the regions producing cotton. Make the color darker in the areas producing the most cotton.
  - b. Make a graph showing the rank of the cotton states in the production of cotton.
- **B. Why is cotton the king of the South?**
  - a. Has the South a favorable climate for cotton? Notice that cotton does best where there are more than 200 frostless days. Frequent showers with warm weather while the cotton is growing, and a rather dry picking season are needed.
  - b. Has the South a favorable soil for cotton? On a soil map, notice the kinds of soil on which cotton seems to do the best. The black soil region of Texas, the alluvial region near the Mississippi River in Arkansas and Mississippi, and the limestone regions in the Carolinas, Georgia and Alabama should not be overlooked.
  - c. Has the South plenty of cheap labor? Here may be discussed the laborers, the prepara-

tion of the land, the planting of the seed, the cultivation of the cotton plant, the boll-weevil, the picking of the cotton, the ginning and baling.

C. **In what other states is cotton raised?**
   a. Southwest United States by irrigation.

D. **What is done with the cotton seed and the stalk?**
   a. Make a list of their uses and discuss the importance of each.

E. **What is done with the baled cotton?**
   a. Sent to markets and sold. On a blank map of the United States locate the cotton markets.
   b. A little less than one-half is exported to foreign countries. On the map showing the cotton markets show the cotton ports of the United States.
   c. The remainder of the cotton is used in the United States.

F. **How does the length and quality of fibers raised in the United States compare with those raised in other regions?**

G. **Where is cotton manufactured in the United States?**
   a. On a blank map of the United States locate the cotton mills.
   b. Make a graph showing the consumption of cotton by the ten leading states.
   c. New England Region. Reasons for its importance. Quality of goods manufactured.
   d. Southern States, especially along the eastern edge of the Appalachian Mountains. Reasons for manufacturing cotton goods. Quality of goods manufactured.

H. **Where are cotton goods manufactured in foreign countries and how do these countries rank in quality of their goods?**
   a. On the world map showing the cotton-producing regions, show the routes over which cotton is shipped in being sent to other countries. Locate the chief cotton ports.
   b. Why does the Liverpool-Manchester district rank so high in the manufacture of cotton goods?
   c. How important is the manufacture of cotton goods in France, Germany, Belgium, Italy, and other European countries?
   d. How do the countries of Asia and South America rank in the manufacture of cotton goods?

I. **What is the future for cotton?**
   a. What is the prospect of increasing the area given over to cotton in each continent?

IV. **A Review of the Problem of Cotton:** At certain places in the work, the pupils make brief reviews of what they have learned. On completing the problem, the teacher and pupils should make certain that the material is classified well in their minds.

V. **Remarks:** Throughout the study of the problem, the pupils use all available material. At favorable times the pupils show lantern slides, pictures, museum material, and any other material which may be of aid in solving the problem. Group work is used whenever it is desired by the pupils.

### Relation to Other Subjects

In using the problem method, the relation which geography has to other subjects is developed. For example, the problems cited show that geography is related to history, spelling, English, literature, reading, arithmetic, nature study, and writing. In teaching geography the teacher should remember that while geography may help other subjects, it likewise may receive help from them. However, the business of the teacher is to develop the geographic viewpoint through the use of suitable geographic material.

# The Project Method in English

ONCE upon a time in the dim past which is so frequently referred to as the Golden Age, schools did not teach English composition at all. One day some reformer discovered that the young people did not speak and write as perfectly as might be desired. The immediate effect of this discovery was to increase the emphasis upon English grammar, which it was hoped might prove corrective of the linguistic weaknesses. A thorough trial, however, convinced everyone that mere knowledge of the structure of the language and of the rules of syntax is not sufficient to prevent error, nor to bring about the formation of strong, clean-cut and expressive sentences.

Obviously grammar does not influence the larger matters of structure or of diction. To grammar rhetoric was added, and still the results in the speech and writing of the high-school and college graduate were difficult to see. The next experiment naturally was a very great increase in the amount of practice, especially in writing. The daily theme became an almost universal institution in both secondary schools and colleges throughout the country. It was frequently accompanied by much drill in the correction of mistakes in syntax and in the rewriting of incoherent and loosely constructed paragraphs. The pupils still not improving as rapidly as was desired, errors were drastically penalized in the grading. Even such heroic action failed to produce the desired improvement.

Thus teachers of English were quite prepared for some new method or procedure whereby they could really teach their pupils to express themselves correctly, easily, and forcefully. The field of English was rich soil well prepared for the educational doctrines of John Dewey, especially as these were interpreted by William H. Kilpatrick. The notion of experience as an educator is almost as old as the race, but only with Dewey did we finally become fully conscious of the obverse of the proposition, namely, that education should be experience. School work then ceases to be a preparation for life and becomes life itself. While it must be somewhat simplified, because life itself is too complex and experience unselected too expensive a school, yet the activities of the schoolroom are to be natural ones, as similar as may be to those in which pupils engage every day outside the walls of the school and those in which they will engage when school days are past.

Now it happens that the typical unit of life is the "purposeful act," or, the "project." The project, or undertaking, then, becomes the typical unit of activity in the composition class. Evidently it must be an undertaking in composition, that is, an attempt to accomplish something by means of speaking or writing. The undertaking, too, must be the pupils' own; that is, it must be something which they purpose to do, not something which they carry out under the domination of a superior will. This will be clearer from some examples.

A second-grade teacher in a demonstration school one summer told her pupils of a certain Baby Margaret not many blocks away whose mother was unable to purchase for her the milk which was essential to her well-being. The teacher went on to say that in the winter this milk had been supplied by the pupils of her room but that the funds would be exhausted within the next week. The pupils were at once eager to undertake the provision of the milk supply for the baby. Upon being asked where they would get the money, they suggested a play for which they would charge admission and a lemonade sale. The lemonade sale was undertaken and became the basis of the arithmetic and some other work during the six-weeks' term, but that does not concern us here. With the teacher's consent they began to lay plans for their drama. First they outlined the action, then decided upon scenes, characters, and speeches, and finally carried through the rehearsals, with criticism by those not taking part. Before the end of the term they were able to give their play with considerable success, both financial and artistic. Here was a typical undertaking carried out chiefly by means of language.

### Some Interesting Projects Developed

A teacher in an upper grade recounts to her children the success of another group she has known with a lecture-recital, making use of the talking machine. She tells how they have chosen a composer or a certain kind of music and have then found selections illustrating the most important characteristics of this composer or type of music, have assigned these selections for special study to individual members of the class, and have then devoted a period or more to hearing the records with accompanying lecturettes by the pupils who have made special studies. Her pupils invariably decide that this sounds very interesting and that they would like to have similar lecture-recitals. The choosing of the subject and the finding of the selections, while not a matter of routine, does become a matter of course. Here again we have pupils' purposes carried into effect by the use of language as a tool.

On another day the teacher gives as vivid an account as she can of the picturesque origin of tapioca and suggests that there are many other items of our dinner tables which have quite as interesting histories. Perhaps some members of the class suggest certain articles about which they have partial information. After a little talk it is decided that they will study together the sources and processes of manufacture of an ideal dinner. They make out the menu and assign the different items to individuals or committees to look up. After the necessary library work, making of outlines, and perhaps rehearsals in small groups, they carry out a formal program in which the entire process of producing the dinner is set forth.

In similar fashion the teacher tells her own experience of being caught in a shower, or of being surprised, or of learning to skate, and is repaid in kind by pupils eager to tell of their own similar experiences. Or she leaves Red Cross Circular No. ARC 618, Supplement 2, on the table, where seemingly by accident it falls into the hands of some of the leaders among the pupils in her room. As they read how other classes exchange portfolios with groups in distant parts of the United States or in European countries, they begin to ask why their class may not do the same thing. The teacher puts them off until such a question can be asked before the whole group, preferably at composition time. The undertaking is explained by those who have read the little booklet and is adopted by the class. The topics likely to interest the far-away readers are listed on the board, and probably divided among the pupils. Then follows some discussion of the fullness of treatment and the matters of grammar or mechanics concerning which the writers need to be most careful in this composition which is to represent their school abroad. When each has done his best, his product is criticised at least by two or three of his neighbors, probably by the whole group—criticised, not in a fault finding spirit but with genuine intent to make improvement possible. Rewriting is then as natural as breathing.

All these cases differ from the mere learning by doing, as exemplified in the daily theme, in that the pupils are not mechanically carrying out the wishes of someone else but are earnestly, and in many cases eagerly, achieving purposes of their own. Such work includes incidentally the grammar that was formerly taught, and quite as much actual practice in speaking and writing as was ever secured under the drill system, but adds to it the pupil's own intention to accomplish, his own interest in what he is doing, and his alertness to the means whereby he can do it well. In other words, he is living completely. The teacher whose class works in this way is, we say, using the project method.

### Steps in the Development of a Project

Let the pupils be genuinely free to form and carry out their own purposes, and it follows, as the day the night, that they will plan together, plan separately, carry out their plans (perhaps with some revisions), and looking back over the whole process, will judge the results. These are just the steps which persons in school or out inevitably take when engaged in any purposeful activity. Whether it be to make a dress, build a house, write a novel, or sell a piece of real estate, from the situation which the individual confronts, he forms a purpose, very frequently formulating it in words. Unless he is very immature, he considers before beginning to act how he may most easily and surely achieve his end. If other persons he knows are engaged in similar undertakings or working with him on his, he is sure to consult with them as to the best means to be employed. Having decided how to proceed, he carries his plans into action. Finally, he looks back over what he has done and decides whether it was worth doing and whether the means he has used were the best possible.

These judgments are not always explicit, and in matters of little moment they are almost unnoticed; but in all attempts in which one is keenly interested there is sure to be a great deal of this evaluating retrospect. If the undertaking has been a failure, why was it? Was the thing impossible to do, or was there some blunder in planning or in executing the plan? If it was a success, there is less talk of the why, but a great deal of re-

counting and glorying in the elements which led to success. Now, in the pupils' composition project we shall expect to have, from the situation which confronts them, their formulation of a purpose; their consultation as to the best means of achieving their end; some individual planning for the individual tasks undertaken; the carrying out, through speech or writing, of these plans; and then the judgment of results—all these by the pupils.

### Materials for Composition Projects

Materials available for projects in English composition include practically everything which pupils may naturally be led to talk about:

(1) The easiest reservoir to tap is that of personal reminiscence, and so for years we had in our schools narratives from experience. These are very easy to start by means of the teacher's own similar narratives.

(2) Very like them, really made of the same elements, are the narratives from imagination. They are frequently stimulated by means of pictures and conversations leading forward or backward from the situations portrayed. They may sometimes originate as digressions from, or as the supplying of gaps in, historical narratives—for example, as Klapper suggests, the narrative of the mutiny on board Columbus's vessel as related by Columbus, by the mate, or by one of the crew.

(3) Coöperative studies of topics or problems in history, geography, or science make excellent composition projects. In many cases teachers throw together the time allotted to one of these other subjects and that allotted to composition and use the combined period for work in which the special subject furnishes the content and the study of English furnishes the form.

The only drawback in projects of this sort has been the frequent inability of the pupils to find the information which they sought. For this purpose, if for no other, every school should have a strong library, especially of reference books. It is desirable that each pupil consult more than one source of information. It is essential if the audience situation—that is, the feeling of both speaker and audience that the speaker has something to give—is to be maintained, that each pupil or committee must work upon a separate topic. Essentially these are reports. Obviously, the same thing may be done in the provision of backgrounds for the study of literature.

(4) If the school is one in which student enterprises of any social sort—the giving of plays or parties, the securing of school improvements, community service of any kind—is common, the planning of these activities will entail discussions which are very genuine composition projects. These discussions may, it is true, sometimes be so informal as to preclude any group prevision of the expression, but much of the time there may be at least individual prevision of the presentation of the argument which will make use of principles of form already learned.

(5) As the English class becomes in this way the deliberative body of the school, it may also become the clerical force and carry out the correspondence necessary to the various activities in which the class is engaged. There are many more occasions for letter writing than we ordinarily observe and too frequently the teacher meets those occasions which are too urgent to be avoided. In this she burdens herself and deprives the pupils of one of the very best opportunities for education.

(6) Letter writing may be supplemented as an exercise in composition by writing for publication, in a school paper if there is one, in a room paper if there is not. In many cases items at least may be contributed to some local daily or weekly paper. All such writing will prove to be very different from the formal, unnatural essays which we have been accustomed to call themes.

### The Plan and the Judgment of Results

As the class group confers concerning its procedure in any composition undertaking, it is likely to consider subject matter first. What needs to be said to persuade somebody? What needs to be found out to inform the class? What elements may be used to entertain the audience? These are the natural first questions. Then follows the division of the task if it is a coöperative study. Just here the pupils may think the plan complete, but this is the teacher's opportunity to suggest that they think how to say it. Whatever principles of form—rhetoric, grammar, or mechanics—they have learned but have not become automatically proficient in, will probably be mentioned by members of the class. In some cases they will foresee problems, such as the pronunciation of French names in a geographical study, or the form in which to tabulate the items of an order letter. This calling to mind the principles of which they should make use in their writing or speaking is exceedingly important in guiding them to successful expression. Five minutes of such consideration is worth an hour's criticism or an hour of a teacher's work in the use of red ink. An error prevented is better than nine corrected.

If such consultation concerning the means of writing or speaking effectively is at all earnest, the teacher will scarcely have to suggest that before anyone proceeds to talk or attempts to write out his speech he ought to make his own individual plan. This means at least an outline, and may very properly include a recall of the comments made upon his last attempt.

The final step is to look back over what has been done and to pass judgment upon it. Sometimes the question, Was it worth while? may be considered explicitly, but always the center of attention is: How far did we succeed and why? The monosyllable why stands for, Why didn't we succeed more completely, and why did we succeed so far as we did? Thus it will bring out both commendable elements of the performance and those which should be discouraged. The mediocre performance gets little attention, as is quite proper. The function of criticism is to encourage and cause to be repeated behavior which is desirable, and to discourage and to prevent the repetition of behavior which is undesirable. Unfortunately, when we speak of it as criticism, we soon fall into the habit of giving whatever censure is necessary and stopping there. This is ineffective in that it fails to establish right habits which are just begun and is frequently deadly in that it breeds discouragement. When criticism becomes judgment of results, it is better balanced and leaves a better taste in the mouth.

### The Function of the Teacher

If the pupils are to purpose, the pupils are to plan, the pupils are to carry out, the pupils are to judge their own performance, why should we have a teacher at all? Let us remember that those who act, and especially those who take responsibility for the action, are the ones who are being educated. The ideal, then, is for the teacher to do only that which is necessary, leaving to the pupils as much opportunity for growth as possible. Even so, the teacher will find plenty to do.

In the first place, pupils are not likely spontaneously to originate a sufficient number of worthy purposes. Neither adults nor children purpose except under the stimulation of circumstances, or, as we sometimes call them, "situations." Now the traditional schoolroom is rather bare of effective stimuli. It is almost an intellectual—in some cases a physical also—vacuum, entirely unsuited to excite pupils to the formation of vital purposes. The teacher, therefore, must provide the "situations" which will stimulate the pupils to the purposing necessary to effective learning.

### Providing the Situation

The projects cited above illustrate some of the devices by which the teacher stimulates group purposing. They may be stated in more general form as follows: She may tell what some other group has done. She may describe a situation which calls for action. She may arouse her children's curiosity so that each will want information and at the same time be eager to give information to his mates. She may, by telling of some experience of her own or by asking some genuine question, create such a natural social situation as occurs when we meet our friends. These are merely a few suggestions. There are as many ways of arousing pupils to purpose as there are different classes.

Even when the pupils have once made up their minds to a certain undertaking, the teacher will still be necessary to keep them at it and at times to furnish the help without which they would fail. We must remember that our children are, after all, children and that their purposes are not always as constant as is necessary for economy in education. When, because the undertaking is long, or because some other interest tends to pull them away, they falter or even wish to abandon the enterprise, it is the teacher's business to keep them at work. It is best if this can be done by suggestions of the value of the undertaking. When this fails, the pupils' pride may be appealed to, even to the point of some joking advice not to show the white feather or a yellow streak. As a last resort it is better to compel them to carry out that which they have formally undertaken than to allow them to get into the habit of leaving work uncompleted.

### Helping Pupils to Keep to the Point

Especially during the planning is there danger that pupils will unintentionally, unconsciously, wander off into the discussion of other matters. Anyone who has ever attended the meeting of an ordinary adult club knows how difficult it is for the chairman to confine discussion to the question before the house. This same difficulty arises in the classroom, and the teacher, as chairman, should see to it that side issues do not entice the pupils from the path toward the goal for which they set out. At times it may be necessary for her to say directly and baldly that someone is talking off the topic, but more usually it will be sufficient for her to raise a question as to what these remarks have to do with the matter in hand; that is, she will help the pupils to find themselves and to see where they got off the track rather than abruptly jerk them back to the place where they ought to be.

### Lending a Hand on Knotty Problems

If the enterprises undertaken are sufficiently broad and complex to be really educative, the pupils are unlikely to have sufficient experience and information to carry them through successfully alone. The teacher, because of strong personality, because of more years of experience, because of a wider general knowledge and better acquaintance with the sources of information, should be able to foresee the results of unwise plans which the children propose and to furnish means of overcoming obstacles which are to them insurmountable. Very frequently the teacher must directly furnish information, almost always she must give hints of sources of information, and all the time she must be present as a counselor and coach to guide the feet of her charges away from the pitfalls which would waste their time and bring discouragement. All this she may do without in any sense being a dictator or boss, by merely making suggestions or questioning the advisability of certain plans and by furnishing aid when she is asked for it. From one point of view the teacher becomes a leader among the children, but one of them. From another point of view she may be thought of as a helper who is called upon to do whatever they cannot do for themselves. Her contribution is fairly sure to be larger than that made by any pupil of the class, but her pupils have more opportunities to act and to grow than do those of the teacher who employs traditional procedures.

### The Teacher's Rôle in Judging Results

In the judgment of the performances, too, the teacher has a necessary rôle. The pupils, unguided, frequently forget what they are trying to do and need to be recalled to the task in hand. The younger the pupils the less able they are to do genuine teamwork and the more liable they are to fall into personalities and mere fault finding. Such worse than waste of time the teacher must prevent. More than all else she must supplement and rectify their critical judgments.

Ability to discriminate accurately between the helpful and the weakening elements in any composition comes only of training. Often the pupils can tell which of two paragraphs is better and yet cannot at all discover the sources of the effectiveness of the one or the hidden weakness of the other. They may rightly expect the teacher to assist in such cases. The teacher, moreover, may so steer this retrospect and evaluation as to raise new problems of rhetoric, grammar, and mechanics, through the study of which new principles will be learned. Without such steering, progress in the knowledges which underlie skill in composition must be haphazard and uncertain.

### Summary of the Project Procedure

Such, then, is the project procedure in composition: Teacher stimulation, pupil purposing, pupil planning, pupil executing, pupil judgment of results—all these with the assistance of the teacher. The plan is economical, inasmuch as it calls out the pupil's whole power. There is no inner conflict between that which he would like to do and that which he feels he must do. Attention is really focused upon the task in hand. If the purpose has been made as definite as it should be, there is also much greater probability of successful performance than by other methods, because the pupil is always conscious of the aim toward which his expression is directed. He doesn't wonder what the teacher wants or what will get a good mark, but is guided by the thought, Will this persuade? Will this entertain? Will this make clear? Because he cares about the end for which he is working, he really takes to heart the comments, both praise and censure, which are passed upon his attempt. This makes criticism genuinely effective. No child engaged in a

genuine project will ever throw away a paper carefully criticized by the teacher without looking at anything more than the mark. Because the pupil has been free, he has enjoyed the activity and comes to look upon addressing an audience and upon writing not as unpleasant tasks which he will avoid so soon as his teacher-autocrat is removed, but as enjoyable activities.

Finally, the pupil who has used the principles of form as means of success in attaining his own ends feels that these principles are worth while and that they will probably work in other situations outside the classroom. The majority of eighth-grade pupils and nearly all high-school graduates have learned to speak and to write for their English teacher with reasonable correctness, if not with genuine effectiveness, but their habitual expression elsewhere is far different. If they can be made to realize that the manner of expression which they use in the English class can be profitably employed wherever they go, we may have some hope that our schools can really raise the level of linguistic expression in our country.

# The Project Method in History

THE content of the history course in the elementary and junior high school and the methods to be employed depend upon what the purposes of the study of history are understood to be. When we have decided what the outcomes of any educational undertaking are to be, we have gone a long way toward deciding upon both content and method.

What, then, are the purposes of the study of history in the grades below the secondary school?

**(1)** The understanding and solution of many present day problems depend upon a knowledge of the origin of these problems. How far has the solution of a given problem been carried and how did men meet and solve similar problems in the past? Why is this problem still unsolved, and what are the possible consequences of this or that solution?

**(2)** Children should be made conscious of the long process of evolution through which our social and governmental ideas have come down to us. They must learn that there are no short cuts to real progress.

**(3)** History in the schools should foster a feeling of responsibility to conserve, improve, and pass on valuable material and spiritual inheritance which have come down to us from the past.

**(4)** History should picture for the pupil the toils, privations, and sacrifices of those who have given us our legacy of American institutions, laws, and ideals of government and civic control.

**(5)** The study of history must teach our children that the rights and privileges of citizenship in a democracy carry with them real duties and responsibilities.

**(6)** The study of history should train the pupil in the use of books, and in the methods of carrying on investigation. It should train him to suspend judgment, to compare conflicting statements, and to have respect for the opinions of others.

**(7)** The study of history should develop in the pupil an appreciation of the value of coöperative effort, even that of men and nations far apart in time and place. The pupil should feel himself debtor to a long line of faithful thinkers and workers.

**(8)** New inventions and new industrial developments call for many complex readjustments. Many such readjustments have been necessary in the past. Pupils should understand that the changes made necessary by inventions have been to the ultimate advantage of mankind, even though the period of readjustment may have been difficult.

**(9)** The study of history should develop character by calling out the best in the pupil in response to the inspiring examples from the past.

The first duty of the teacher who would employ the project method is to decide upon the experiences which she wishes her pupils to live through. The teacher may then plan projects which will lead toward the desired experiences. While the teacher must have the final outcome of the undertaking in mind from the beginning, she should not make the mistake of always imposing her own projects upon the children. Pupils will engage most heartily in those activities which they feel answer to their present needs most directly.

The use of the project method in history will cause the pupils to work together for the common good; it will teach the value of the division of labor and the pooling of results. These experiences in themselves constitute valuable lessons in democracy. The socialization of the study period, as well as of the recitation period, will be accomplished without the use of any special device.

The following projects may be studied as explanations of present day conditions and events, or they may be used in the course of a more formal development of the subject in the traditional manner. The examples are intended to be suggestive only. A course of study made up of projects which are to be followed slavishly is only a little better than a topical course. The pupils should be lead to discover and organize their own large projects. Carefully guided discussion will soon cause the large, more vague projects to become analyzed into several smaller, more specific projects. When this stage has been reached the class is ready to divide the work of investigation among various groups or individuals of the class.

**I. Constructing a Forecast Map of a Presidential Election:**

- **A.** What does the Constitution say about the election of the president? Why did not the makers of the Constitution provide for the direct election of the president?
- **B.** Write the number of electoral votes of each state on a blank outline map.
- **C.** How did each state vote in the last three or four presidential elections?
- **D.** What factors may change certain states to another column in this election?
- **E.** Construct a colored forecast map of the United States. Compare this map with the election returns.
- **F.** What is the cause of the "Solid South"?
- **G.** What is the cause of the almost equally solid New England?

**II. A Forecast of the President's Message:**
What questions will the president probably discuss in his message? What labor and industrial

questions? What questions about foreign relations and treatics? What financial matters? What political questions?

III. **Would You Favor Giving the President a Term of Six Years?**
- A. How could this change be made?
- B. Does a president ever favor laws because he thinks they will aid his reëlection?
- C. Does a president ever make appointments for the same reason?

IV. **Amending the Constitution of the United States:** If a proposed amendment is before the states, each pupil should color a map showing the progress toward ratification. No other method can make the process, as well as the extreme difficulty, of amending the Constitution so plain.

V. **The Constitutional Convention, 1787:**
- A. Write a report of a supposed conversation betwcen delegates while they were waiting for the convention to open.
- B. To make the conversations historically true we must know:
  - a. The weaknesses of the Confederation Government.
  - b. The conditions of trade between the states.
  - c. About states' jealousics and fears.
  - d. The fears of the people about federal taxation and power.
  - e. The importance of the Northwest Territory.
  - f. Lack of respect on the part of foreign powers for the Confederation Government.

VI. **Report a Conversation Between a Federalist and an Anti-Federalist About the Ratification of the Constitution:** In order to make the Constitution true to history, it will be necessary to find out what arguments were used for and against ratification. Remember also that in some states ratification was immediate and easily accomplished, in other states delayed and difficult.

VII. **Should Immigration to the United States Be Restricted?**
- A. How many immigrants have entered the United States since 1870?
- B. Classify these immigrants as from Northern, Central, or Southern Europe.
- C. What are the characteristics of a good citizen?
- D. What are the desirable traits of present day immigrants? What traits are undesirable?
- E. What economic conditions make restriction of immigration desirable or undesirable at the present time?
- F. Why do so many immigrants live in large cities?
- G. What are the most important agencies for the Americanization of the foreign born?

VIII. **What are the Causes of the Recent Movement of Negroes from the South into Great Industrial Cities of the North?**
- A. Educational, political, and economic advantages to the negroes? Disadvantages of crowded and insanitary living conditions.
- B. New problems of the cities affected.
- C. Effect upon the South.
- D. Progress of the negro race since emancipation.

IX. **In What Ways Does the "New South" Differ from the "Old South"?**
- A. Differing labor conditions.
- B. Industrial development since the Civil War.
- C. Effect of the development of a skilled white laboring class.
- D. Improved educational advantages.
- E. Improved transportation facilities.
- F. Changed social conditions.

X. **Why Have Many Industries Been Taken from the Home to the Factory?**
- A. Examples: the making of cloth and clothing, shoes, cheese, butter and soap; the canning of vegetables and fruits; the preservation of meats such as bacon.
- B. Effect upon home life.
- C. Upon prices.
- D. Upon growth of cities.
- E. Upon the number of wage workers.
- F. Upon the price of articles made.
- G. Upon the usefulness of the articles.

XI. **How Did the Invention of the Steam Engine, the Cotton Gin, the Power Loom, and the Spinning Jenny, Considered as a Group, Influence Life in America and England?**
- A. Slavery and slave extcnsion westward.
- B. Development of factories in the North and in England.
- C. The growth, price, and exportation of cotton.
- D. The use of cotton cloth.
- E. Present-day labor conditions in the South.
- F. The race question.

XII. **Is the Rapid Growth of Cities in the United States a Good Thing?**
- A. Make a graph showing the number of people living in cities of 10,000 and over, according to the census reports from 1850 to the present time.
- B. What are some of the causes of this rapid growth of cities in the United States?
- C. What new conditions might check this growth of city population?

XIII. **How Did the Invention of the Steamboat Help the Development of the Mississippi Valley?**

XIV. **How Did the Building of the Erie Canal Give New York an Advantage over the Atlantic Ports?**

XV. **What Has Been the Effect of the Invention of the Reaper?** Think about the development of the West, the possibility of large farms, the price of flour, the number of farm workers required, and the exportation of grain from the United States.

XVI. **Was it Right for the United States to Help the Companies Build the Pacific Railroads?**
- A. Find out what aid was given.
- B. Resources opened to use. Value to all the people.
- C. Value of the Pacific Railroads to the Pacific Coast states.

XVII. **Was the Mexican War Just?**
- A. Relation between the annexation of Texas and the extension of slavery.

*consult the Easy Reference Fact-Index at the end of this work*

B. How did the payment for the land taken from Mexico affeet the question of the justiee of the war?
C. Is the region better off today than it would be under Mexiean rule?
D. If such valuable states as Texas and California were a part of Mexico today, how might they improve eonditions in that eountry?

**XVIII. Why Were There Such Marked Differences Between the Lives of Colonists in Virginia and in Massachusetts?**

Think about the kinds of people who settled these colonies, the industries, productions, size of farms, local government, ideas about education, homes and home life, and labor.

**XIX. Compare a Kitchen in a Plymouth Colony Home with a Kitchen in a Modern City Home.**

**XX. If Benjamin Franklin Could Come Back Today, what Inventions and Changes Would Interest Him Most?**

Think about his interest in improving life in the eities, his inventions, how he made his living, and his interest in the new government.

**XXI. How Does the Building of Good Roads and the Use of Motor Trucks Affect the "Short Hauling" of Goods by the Railroads?**

**XXII. Why Has It Been Possible for the People of the United States and Canada to Get on Without Forts and Armies Along the Border Between the Two Countries?**

**XXIII. Should the United States Continue to Control the Philippine Islands?**

A. How have we helped these people?
B. Are they eontented under our rule?
C. How mueh self government have we allowed them?
D. Are the Filipinos eapable of eomplete self government?
E. Of what value are the islands to the United States?
F. To what dangers does the eontrol of the islands expose the Unitcd States?

**XXIV. What Events Have Made the United States a "World Power"?**

Think about the effects of the Spanish-Ameriean War, the building of the Panama Canal, the World War, and our rapidly growing foreign trade.

**XXV. Construct a Colored Map Showing the Territorial Growth of the United States.**

**XXVI. In What Respects Were the Revolutionary War and the Civil War Alike? In What Respects Were They Unlike?**

A. Was the Revolution a civil war?
B. In what ways had the people of the English eolonies and the people of England beeome different?
C. Were all the people in the eolonies in favor of indepcndenee?
D. In what ways were the people of the North and South different?

# The
# EASY REFERENCE
# FACT-INDEX

*of*

COMPTON'S
PICTURED ENCYCLOPEDIA

# Editor's Note

EVERY user of a Compton's Pictured Encyclopedia should form the habit of *first* turning to the Fact-Index when in search of specific information. This is a miniature work of reference in itself, presenting the essential facts about a large proportion of the entries which it contains. When additional information is presented in the preceding volumes, the page numbers (in **black-face** type) show the reader where to turn.

The first reference in every case where page numbers are given is to the most important place of treatment, with other general references following. Thus, under the entry **"Appalachian Mts.,"** the first reference is to the article bearing that heading in Volume I, followed by a reference to the article "United States," and then by a reference to the section of the Study Outlines which enumerates the various divisions of the Appalachians. Then follow various scattered references, arranged alphabetically under appropriate subheadings, such as "effect on climate," "geological history," "minerals," etc.

The arrangement of subheadings is always alphabetical, except in the case of most major historical and biographical entries. In these the chronological order is followed.

Pictures have not been indexed where they appear on the same pages with text references, except for purposes of special emphasis or to prevent confusion. The word *picture* in an entry does not necessarily mean a picture of the subject of the entry; often it rather calls attention to the matter contained in the accompanying picture-text. For example, under the heading **"Rawlinson"** there is a brief sketch of the man, with a reference to the picture of the Behistun Rock on page 2739, under which appears a description of how Sir Henry Rawlinson discovered this rock and deciphered the inscriptions on it.

The pronunciations given are those preferred by the best and most recent authorities; alternative pronunciations are indicated only where usage is equally divided. For foreign names the native pronunciation is given except where the English pronunciation has become thoroughly established, as in "Paris," "Barcelona," "Seine."

Populations are given in round numbers, except for places in the United States, where the figures are those of the 1920 census. Distances between points are map distances, not distances by railroad.

## Special Abbreviations Used in this Fact-Index

Amer.—America, American
anc.—ancient
b.—born
Bapt.—Baptist
Belg.—Belgian
Brit.—British
cap.—capital
Cath.—Catholic
cent.—century, central
Cong.—Congregational
d.—died
dept.—department
dist.—district
e.—east
Egypt.—Egyptian
Eng.—English
Episc.—Episcopal
Fr.—French
Ger.—German
Gk.—Greek
govt.—government
Gt. Brit.—Great Britain
isl.—island
Ital.—Italian
l.—lake
Luth.—Lutheran
Meth.—Methodist
Mex.—Mexican
mfg.—manufacturing
mfrs.—manufactures
mt.—mountain
myth.—mythology
pop.—population
Port.—Portuguese
pres.—president.
Presb.—Presbyterian
r.—river
rev.—revolution, revolutionary
Rom.—Roman
r.r.—railroad
Rus.—Russian
s.—south
sec.—secretary
Span.—Spanish
sq. mi.—square miles
U., Univ.—University
w.—west
yrs.—years

(For other abbreviations, *see* page 4072.)

# The EASY REFERENCE FACT-INDEX

## A

YOU know, of course, that members of the bird family—notably the goose—helped teach men to write, by furnishing them with quills, but did you know that some of the bird people helped make the very letters that were afterward written with their quills? The owl, for example, with his horns and his beak, gave us our M. The letter Z was originally a duck, a duck of ancient Egypt that, in its formalized shape, now waddles along at the end of the alphabet, while the lordly eagle leads the procession as the A. In Egyptian picture writing the eagle first had its proper shape, like this:  Then as it came to be made by the Egyptian scribe in writing a running hand, it was simplified to this:  When the letter in this second form passed over into the Phoenician alphabet and was used in stone inscriptions, it was easier to carve by using straight strokes of the chisel, and it was made like this:  After the Greeks got it from the Phoenicians **A** and put it into their alphabet, they gradually straightened it up to a horizontal position, thus: **A** making the letter as we have it today. Besides being so useful in telling other people's stories in books, you see the letters have interesting stories of their own. You will find one of these stories at the beginning of each Letter Section in this Fact-Index.

**Aachen** (*ä'кĕn*) or **Aix-la-Chapelle** (*āks-lä-shä-pĕl'*), Germany, pop. 150,000; coronation city of Holy Rom. Empire; **1.**

**Aalborg** (*ąl'bôrg*) ("Eel-town"), Denmark, chief port of n. Jutland, 20 mi. above the Kattegat; pop. 38,000; exports fish, grain; important commercially from medieval times; plundered by Wallenstein and by Swedes in 17th cent.; **996.**

**Aar** (*är*), largest r. (180 mi.) entirely within Switzerland; rises in Aar Glacier and flows n. w., falling into Rhine opposite Waldshut; **3412, 3414;** at Bern, **386, 387.**

**Aardvark** (*ärd'värk*) ("earth pig"), a giant ant-eater of S. Africa, **145.**

**Aard'wolf** ("earth wolf"), a hyena-like mammal of Africa; food chiefly insects and carrion, **34.**

**Aarhuus** (*ąr'hụs*), 2d largest city of Denmark; pop. 66,000; large trade in grain, cattle; shipyards, iron foundries; seat of bishop since 10th cent.; fine 13th cent. cathedral; **996.**

**Aaron** (*ăr'ŏn*). First high priest of Israelites, brother of Moses. *See also in Index* **Golden Calf.**

**Aaron's Rod.** Various tall flowering plants (goldenrod, mullen, etc.) named from budding and flowering of Aaron's rod (Num. xvii); in architecture, ornamental rod with leaves or entwined serpent.

**Abaca** (*ăb'ä-kä*), a plant (*Musa textilis*), source of Manila hemp, **2769, 325.**

**Abacus** (*ăb'ä-kŭs*), a calculating instrument, **198;** in architecture, the slab which forms the top of a capital.

**Abalone** (*ăb-ä-lō'nē*), a shell-fish, **3202, 3945;** *pictures,* **3203, 2229.**

**Ab'ana** or **Amanah** (now Barada) and **Pharpar** (now Awaj). Two famous "rivers of Damascus" mentioned in Bible (II Kings v, 12).

**Abattoir** (*ä-bä-twär'*), a slaughter-house. *See in Index* **Meat packing.**

**Abbas** (*ä'bäs*) **I,** "the Great" (1557–1628), ruler of Persia, **2738.**

**Abbas II, Hilmi** (born 1874). Third khedive of Egypt; ruled under Brit. supervision until deposed (1914) for plotting with Turks.

**Abbasids** (*ă-băs'ĭdz*). Second great dynasty of Mohammedan califs; ruled at Bagdad 750–1258; based claim on descent from Abbas, uncle of Mohammed; most famous sovereign Harun-al-Raschid.

**Ab'bess,** head of a convent, **2302.**

**Abbeville** (*ăb-vēl'*), France. Picturesque town on Somme, 12 mi. above English Channel; known from 9th cent.; pop. 20,000; cloth mfrs.

**Ab'bey, Edwin Austin** (1852–1911), Amer. illustrator and mural decorator; b. in Philadelphia, Pa. ('Quest of the Holy Grail' in Boston Public Library; 'Apotheosis of Pennsylvania' in state capitol); **2634, 1591;** paintings by, *pictures,* **224.**

**Abbey,** a monastery or nunnery, **2299.**

**Abbot, Willis John** (born 1863). Amer. newspaper editor and author; b. New Haven, Conn.; became editor *Christian Science Monitor* 1922; ('Blue Jackets of '76'; 'Battle Fields and Camp Fires').

**Abbot,** head of a monastery, **2300, 2687.**

**Ab'botsford,** baronial home of Sir Walter Scott on Tweed R., 3 mi. from Melrose Abbey, Scotland, **3151, 1082.**

**Abbott, Emma** (1849–91). Amer. soprano, b. Chicago, Ill.; organized opera company and toured U. S.

**Abbott, Jacob** (1803–79). Amer. writer of juvenile books, educator, and Cong. preacher; b. Hallowell, Me. ('Rollo Books').

**Abbott, Sir John J. C.** (1821–93). Conservative prime minister (1891–92) of Canada.

**Abbott, John S. C.** (1805–77). Amer. historian, brother of Jacob Abbott, b. Brunswick, Me.; popular and readable books ('History of Napoleon Bonaparte'; 'The French Revolution').

**Abbott, Lyman** (1835–1922). Amer. Cong. preacher and author, b. Roxbury, Mass.; Beecher's successor at Plymouth Church, Brooklyn; editor of the *Outlook;* son of Jacob Abbott.

**Abbreviations.** The most commonly used abbreviations and their meanings are given in the list beginning on page **4072.** For the abbreviations used in this Index *see* page **4070.**

**"A B C Powers,"** the three chief S. Amer. powers, Argentina, Brazil, and Chile; intervention between Mexico and U. S., **2217.**

**Abd El Kader** (*äbd ĕl kä'dēr*) (1807?–83). Arab chief; struggled for 15 yrs. against Fr. conquest of Algeria; surrendered 1847.

**Abdomen** (*ăb-dō'mĕn* or *ăb'dō-mĕn*), in the human body, the lower cavity containing liver, pancreas, spleen, kidneys, stomach, small and large intestines, and other organs; of insects, **1787,** *picture,* **1788;** of spider, **3326.**

**Abdul-Aziz** (*äb'dụl-ä-zēz'*) (1830–76). Sultan of Turkey; succeeded 1861; misgovernment caused many uprisings; deposed 1876.

**Abdul-Hamid** (*hä-mēd'*) **II** (1842–1918), sultan of Turkey; succeeded 1876; encouraged massacres of Christian subjects; ruled by terror and spy system; deposed, **3560.**

**Abdul-Mejid** (*mä-jēd'*) (1823–61). Sultan of Turkey; succeeded 1839; kindly but weak would-be reformer; France and England fought Crimean War in his behalf.

**A'bel.** Younger son of Adam and Eve; killed by Cain, his brother (Gen. iv).

**Ab'elard, Peter** (1079–1142), Fr. scholar and philosopher, **2, 831, 515.**

**Abercromby** or **Abercrombie** (*ăb'ĕr-krŏm-bĭ*), **James** (1706–81). Brit. general; repulsed by French under Montcalm at Ticonderoga, N. Y. (1758).

**Aberdare** (*ăb-ĕr-dăr'*), Wales. Coal mining town in s. e.; iron and tin-plate works, brickworks, brewcries; pop. 51,000.

**Aberdeen** (*ăb-ĕr-dēn'*), **John Campbell Gordon, Marquis of** (born 1847). Gov.-gen. of Canada 1893–8, lord-lieut. of Ireland 1886, 1905–15.

**Aberdeen,** 4th largest city in Scotland; pop. 170,000; **2.**

**Aberdeen,** S. D., 2d city in state, 125 mi. n. e. of Pierre; pop. 14,537; mfg. and trade center; grain elevators, creameries; **3297.**

**Aberdeen,** Wash. City on Grays Harbor in s. w.; pop. 15,337; lumber mfg. and shipping; salmon canneries.
**Aberdeen, University of, 832, 2.**
**Aberdeen Angus,** breed of beef-cattle, **663.**
**Aberdeen'shire.** County of Scotland projecting farthest n.e. into North Sea; 1971 sq. mi.; pop. 305,000; stock-raising, agriculture, granite-quarrying, fishing.
**Aberra'tion,** chromatic, **2228, 1987–8;** spherical, **2228;** in telescopes, **3462.**
**Abies** (*ăb'i-ēz*), the fir genus, **1248.**
**Abigail** (*ăb'i-gāl*). Wife of Nabal; ministered to the fleeing David, who married her on Nabal's death (I Sam. xxv, 14–42); name used to mean a waiting-maid.
**Abilene** (*ăb'i-lēn*), Tex. Center of farming and stock-raising district 140 mi. w. of Ft. Worth; pop. 10,274; cotton gins, flour mills, oil refineries.
**Abiogenesis** (*ăb-ī-ō-ĵĕn'ē-sĭs*), or spontaneous generation. the production of living organisms from non-living matter; theory now discredited, **398.**
**Abo** (*ä'bō*), also **Turku** or **Turlen,** Finland. Baltic port opposite Aland Isls.; pop. 56,000; oldest city and former cap.; shipbuilding, mfg.; exports timber, dairy products; Swedish Univ. (founded 1919).
**Aboli'tionist movement,** to end negro slavery in U. S., **1401, 3736, 3391–2;** centers of influence, **473, 2572;** Liberty Party, **2871;** stand on Compromise of 1850, **856, 3711;** and women's rights movement, **3778.** *See also in Index* **Slavery.**
**Abomey** (*ä-bō'mi*). Former cap. of Dahomey, Fr. W. Africa; pop. 16,000.
**Aborigines** (*ăb-ō-rĭġ'i-nēz*). Name given by Romans to a people of cent. Italy, traditionally said to have descended from their mountain home near Reate upon Latium, where they settled down as Latini. Term now applied to original, or earliest known, inhabitants of any country.
**Abou-ben-Adhem** (*ä-bo͞o-bĕn-äd'hĕm*). In Leigh Hunt's poem, sees in a vision an angel writing "the names of those who love the Lord"; asks to be counted as one who loves his fellow-men, and learns that the love of man is the love of God.
**Aboukir** (*ä-bo͞o-kēr'*) or **Abukir Bay,** on n. coast of Egypt, w. of Rosetta mouth of Nile; battle of (1798), **2435, 2393.**
**A'braham,** founder of Hebrew nation, **2–3, 1889, 2644.**
**Abraham, Plains of,** battlefield near Quebec where Wolfe defeated Montcalm (1759), **3775, 2949.**
**Abruzzi** (*ä-bro͞ot'zē*), **Luigi, Duke of the** (born 1873), Ital. royal prince, explorer, and scientist; first to ascend Mt. St. Elias, Alaska (1897); commanded Ital. fleet in World War; dash for North Pole, **2862.**
**Abruzzi e Molise** (*ä mô'lē-zā*), dept. in cent. Italy; 6387 sq. mi.; pop. 1,500,000; includes highest point of Apennines, *Gran Sasso d'Italia* ("great rock of Italy") culminating in Mt. Corno; **1840–1, 154.**

## LIST OF ABBREVIATIONS

A—argon.
A.A.A.—American Automobile Association.
A.A.U.—Amateur Athletic Union.
A.B.—*Artium Baccalaureus,* Bachelor of Arts; able-bodied seaman.
A.C.—alternating current.
accel.—*accelerando,* with increasing rapidity (music).
A.D.—*Anno Domini,* in the year of our Lord.
adag.—*adagio,* slow.
A.D.C.—aide-de-camp.
ad lib.—*ad libitum,* at pleasure.
A.E.F.—American Expeditionary Forces.
aet.—*aetatis,* in the year of his age.
A.F.A.M.—Ancient Free and Accepted Masons.
A.F.L.—American Federation of Labor.
Ag—silver.
Al—aluminum.
Ala.—Alabama.
Alas.—Alaska.
A.M.—*ante meridiem,* before noon; *Artium Magister,* Master of Arts.
A.M.A.—American Medical Association.
A.M.D.G.—*Ad majorem Dei gloriam,* "To the greater glory of God." Motto of the Jesuits.
Anon.—anonymous.
A.O.F.—Ancient Order of Foresters.
A.O.H.—Ancient Order of Hibernians.
A.O.U.W.—Ancient Order of United Workmen.
Apr.—April.
apud—in writings of.
aq.—*aqua,* water.
A.R.A.—Associate of the Royal Academy.
A.R.A.M.—Associate of the Royal Academy of Music.
Ariz.—Arizona.
Ark.—Arkansas.
As—arsenic.
Au—gold.
A.U.C.—*ab urbe condita,* from the founding of Rome.
Aug.—August.
A.V.—Authorized Version (of the Bible).
Ave.—Avenue.
A.W.O.L.—absent without leave (army slang).

B

B—boron.
B.A.—*Baccalaureus Artium,* Bachelor of Arts.
Ba—barium.
Bart., Bt.—Baronet.
bbl.—barrel.
B.C.—before Christ; British Columbia.
B.C.E.—Bachelor of Civil Engineering.
B.C.L.—Bachelor of Civil Law.
B.D.—*Baccalaureus Divinitatis,* Bachelor of Divinity.
B.D.S.—Bachelor of Dental Surgery.
Be—beryllium.
Bi—bismuth.
B.Litt.—*Baccalaureus Litterarum,* Bachelor of Literature.
B.LL.—*Baccalaureus Legum,* Bachelor of Laws.
B.M.—*Baccalaureus Medicinae,* Bachelor of Medicine.
B.M.E.—Bachelor of Mechanical Engineering.
B.Mus.—*Baccalaureus Musicae,* Bachelor of Music.
B.Ph.—*Baccalaureus Philosophiae,* Bachelor of Philosophy.
B.P.O.E.—Benevolent and Protective Order of Elks.
Br—bromine.
B.S.—Bachelor in Surgery; Bachelor of Science.
B.Sc.—*Baccalaureus Scientiae,* Bachelor of Science.
b.t.u.—British thermal unit.
bu., bus.—bushel.
B.Y.P.U.—Baptist Young People's Union.

C

C.—*centum;* one hundred; centigrade; carbon.
c., cir.—*circa, circum,* about.
Ca—calcium.
Calif.—California.
Can.—Canada.
Cantab.—*Cantabrigiensis,* of Cambridge.
C.B.—Companion of the Bath.
Cb—columbium.
c.c.—cubic centimeter.
Cd—cadmium.
C.E.—Civil Engineer; Christian Endeavor Society; Church of England.
Ce—cerium.
cf.—*confer,* compare.
ch., chap.—chapter.
Chron.—Chronicles.
C.I.—Order of the Crown of India.
C.I.E.—Companion of the Order of the Indian Empire.
Cl—chlorine.
cm.—centimeter.
C.M.G.—Companion of the Order of St. Michael and St. George.
C.O.—Commanding Officer.
Co.—company; county; cobalt.
c/o—care of.
C.O.D.—cash on delivery, collect on delivery.
Col.—Colonel; Colossians.
Colo.—Colorado.
Conn.—Connecticut.
Cor.—Corinthians.
cp.—compare.
C.P.A.—Certified Public Accountant.
Cr.—credit; chromium.
cres.—*crescendo,* gradual increase of tone (music).
Cs—caesium.
C.S.I.—Companion of the Star of India.
cts.—cents.
Cu—copper.
cu.—cubic.
C.V., Com. Ver.—Common Version (of the Bible).
C.V.O.—Commander of the Royal Victorian Order.
cwt.—hundredweight.

D

D.—five hundred.
d.—*denarius,* a penny.
Dak.—Dakota.
Dan.—Daniel.
D.A.R.—Daughters of the American Revolution.
D.C.—*da capo,* from the beginning; District of Columbia; direct current.
D.C.L.—Doctor of Civil Law.
D.Cn.L.—Doctor of Canon Law.
D.D.—*Divinitatis Doctor,* Doctor of Divinity.
D.D.D.—*Dat, donat, dicatque,* "He gives, presents, and dedicates." Often written after the name of a donor on a flyleaf.
D.D.S.—Doctor of Dental Surgery.
Del.—Delaware.
D.Eng.—Doctor of Engineering.
Deut.—Deuteronomy.
dim.—*diminuendo,* gradual decrease of tone (music).
D.Litt.—Doctor of Literature.
dm.—decimeter.
D.M.D.—Doctor of Dental Medicine.
D.Mus.—*Doctor Musicae,* Doctor of Music.
do.—*ditto,* the same.
Dr.—Doctor; debtor.
D.S.—*dal segno,* from the sign; Doctor of Science.
D.S.C.—Distinguished Service Cross.
D.Sc.—Doctor of Science.
D.S.M.—Distingulshed Service Medal.
D.S.O.—Distinguished Service Order.
D.T.—*Doctor Theologiae,* Doctor of Theology.
D.V.—*Deo volente,* God willing.
D.V.M.—Doctor of Veterinary Medicine.
dwt.—pennyweight.
Dy—dysprosium.

E

E.—East.
Eccles.—Ecclesiastes.
E.E.—Electrical Engineer.
e.g.—*exempli gratia,* for example.
E.M.—Mining Engineer.
E.M.F.—electromotive force.
Eph.—Ephesians.
Er—erbium.
Esq.—Esquire.
et al.—*et alibi,* and elsewhere; *et alii,* and others.
etc.—*et cetera,* and so on.
et seq., sq., or sqq.—*et sequentes, et sequentia,* and the following.
Eu—europium.
Exod.—Exodus.
Ezek.—Ezekiel.

F

F.—Fahrenheit; fluorine.
f.—*forte,* loud; franc (French money); following (page).
F.A.—Field Artillery.
F.A.M.—Free and Accepted Masons.
F.B.A.—Fellow of the British Academy.
Fe—iron.
Feb.—February.
ff.—*fortissimo,* very loud; folios; following (pages).
fl.—flourished.
Fla.—Florida.
f.o.b.—free on board.
F.R.C.P.—Fellow of Royal College of Physicians.
F.R.C.S.—Fellow of Royal College of Surgeons.
F.R.G.S.—Fellow of Royal Geographical Society.
Fri.—Friday.
F.R.S.—Fellow of the Royal Society.
Ft.—Fort.
ft.—feet, foot.

G

g.—gram.
Ga.—Georgia; gallium.
Gal.—Galatians; gallon
G.A.R.—Grand Army of the Republic.
G.C.B.—Grand Cross of the Bath.
G.C.D.—greatest common divisor.

**Ab'salom,** handsome unscrupulous son of David; rebelled against his father; caught by his long hair in tree he was riding under and slain. (II Sam. xiv-xviii); **967.**

**'Absalom and Achit'ophel',** allegorical satire by Dryden, in which Duke of Monmouth figures as Absalom, and Charles II as Achitophel, **1043.**

**Ab'scess,** a collection of pus in a body tissue; in dentistry, **998.**

**Ab'solute, Sir Anthony.** In Sheridan's comedy 'The Rivals', blustering kind-hearted old gentleman; his son Captain Absolute makes way by humorous strategy.

**Absolute zero, 1618.**

**Absorp'tion,** of heat, **1620;** of light, **837;** in plants, **2824–9.**

**Absorption spectrum, 3312.**

**Abt** (*äpt*), **Franz** (1819–85). Ger. song composer ('When the Swallows Homeward Fly').

**Abu** (*ä'bu*), mountain in India, **1749.**

**Abu Bekr** (*bēk'r*), first Mohammedan calif, father-in-law of Mohammed, **2278.**

**Abu Simbel,** Egypt, group of three temples of Rameses II hewn in rock near 2d cataract of Nile, **1106.**

**Abu'tilon.** Genus of plants of the mallow family, mostly tropical or semitropical; some species with red, yellow, or white pendant blossoms, called flowering maples, are grown in pots, like geraniums.

**Abutment,** of arch, *picture,* **174.**

**Abydos** (*à-bī'dŏs*), Asia Minor, anc. city at narrowest point of Hellespont, where Xerxes built bridge of boats; home of Leander, **1645.**

**Abydos,** Egypt, anc. city on Nile, once second only to Thebes; held sacred as burial place of Osiris; excavations near, **1099.**

**Abyssal fauna,** or deep-sea animals, **2556, 396.**

**Abyssinia** (*ăb-ĭ-sĭn'ĭ-à*), independent native state in Africa, near Red Sea; anc. Ethiopia; about one-fourth larger than Texas; pop. 5,000,000, **3–4,** *maps,* **3, 40–1;** Italian war, **3, 40;** original home of coffee, **820,** of donkey, **236;** sacred baboon, *picture,* **2291.**

**Acacia** (*à-kā'shà*), widely distributed genus of shrubs and trees, producing valuable gums, **4;** how it keeps away ant foes, *picture,* **2825;** sensitive properties, **3174;** source of gum arabic, **1552;** in Sudan, **1093.**

**Acad'emy,** American, **4;** of anc. Athens, **4, 2832;** British, **4;** French, **4, 1364.**

**Acadia** (*à-kā'dĭ-à*), former Fr. colony in N. Amer., **4, 2538, 617;** New Brunswick part of, **2449.**

**Acadia University.** At Wolfville, Nova Scotia; includes Acadia Seminary for Young Ladies; Bapt. in origin but non-sectarian; founded 1838 (present name 1891); arts and sciences, theology, music, engineering; closely connected with McGill Univ.

**Acajutla** (*ä-kä-hut'lä*), 2d seaport of Salvador, Cent. Amer.; exports sugar, coffee; **3119.**

**Acanthus** (*à-kăn'thŭs*), a plant, found chiefly in the tropics and s. Europe, whose graceful deeply indented leaves inspired form of Corinthian capital, **886,** *picture,* **180.**

## LIST OF ABBREVIATIONS *(Continued)*

G.C.H.—Grand Cross of Hanover.
G.C.I.E.—Grand Commander of the Indian Empire.
G.C.L.H.—Grand Cross of the Legion of Honor.
G.C.M.G.—Grand Cross of St. Michael and St. George.
G.C.S.I.—Grand Commander of the Star of India.
G.C.V.O.—Grand Commander of the Victorian Order.
Gd—gadolinium.
Ge—germanium.
Gen.—General; Genesis.
Gl—glucinum.
G.M.—Grand Master.
G.O.P.—Grand Old Party (Republican Party, U. S.).
Gov.—Governor.

**H**

H—hydrogen.
Hab.—Habakkuk.
Hag.—Haggai.
He—helium.
Heb.—Hebrews (Book of).
Hg—mercury.
hhd.—hogshead.
H.I.—Hawaiian Islands.
H.I.H.—His (or Her) Imperial Highness.
H.I.M.—His (or Her) Imperial Majesty.
H.M.S.—His (or Her) Majesty's Ship (or Service).
Hon.—Honorable, honorary.
Hos.—Hosea.
h.p.—horse-power.
H.R.—House of Representatives.
hr.—hour.
H.R.E.—Holy Roman Empire.

**I**

I—iodine.
Ia.—Iowa.
ib., ibid.—*ibidem,* in the same place.
I.C.S.—Indian Civil Service.
id.—*idem,* the same.
Ida.—Idaho.
i.e.—*id est,* that is.
I.H.S.—*Iesus Hominum Salvator,* Jesus, the Savior of Men.
Ill., Ills.—Illinois.
In—indium.
in.—inch, inches.
inc.—incorporated, inclusive.
incog.—incognito.
Ind.—Indiana.
inf.—*infra,* below.
I.N.R.I.—*Iesus Nazarenus, Rex Iudaeorum,* Jesus of Nazareth, King of the Jews.
inst.—*instante mense,* this month.
I.O.C.I.—Imperial Order of the Crown of India.
I.O.G.T.—Independent Order of Good Templars.
I.O.O.F.—Independent Order of Odd Fellows.
I.O.U.—I owe you.
Ir—iridium.
Isa.—Isaiah.
I.S.O.—Imperial Service Order.
I.W.W.—Industrial Workers of the World.

**J**

Jan.—January.
Jas.—James.
J.C.D.—*Juris Civilis Doctor,* Doctor of Civil Law.
J.D.—*Juris Doctor,* Doctor of Law.
Josh.—Joshua.
J.P.—Justice of the Peace.
Jr.—Junior.
J.U.D.—*Juris Utriusque Doctor,* Doctor of both Civil and Canon Law.
Judg.—Judges.

**K**

K—potassium; karat.
Kan., Kans., Kas.—Kansas.
K.B.—Knight of the Bath; King's Bench.
K.C.—Knights of Columbus; King's Counsel.
K.C.B.—Knight Commander of the Bath.
K.C.H.—Knight Commander of Hanover.
K.C.I.E.—Knight Commander of the Indian Empire.
K.C.M.G.—Knight Commander of St. Michael and St. George.
K.C.S.I.—Knight Commander of the Star of India.
K.C.V.O.—Knight Commander of the Victorian Order.
K.G.—Knight of the Garter.
kg.—kilogram.
K.G.C.—Knight of the Grand Cross.
K.G.C.B.—Knight of the Grand Cross of the Bath.
K.G.C.M.G.—Knight of the Grand Cross of St. Michael and St. George.
K.G.H.—Knight of the Guelphs of Hanover.
K.H.—Knight of Hanover.
kl.—kilolIter.
K.L.H.—Knight of the Legion of Honor.
K.M.—Knight of Malta.
km.—kilometer (km.²—square kilometer).
K. of P.—Knights of Pythias.
K.P.—Knight of St. Patrick; Kitchen Police (slang).
Kr—krypton.
K.T.—Knights Templar; Knight of the Thistle.
kw.—kilowatt.
kw.-hr.—kilowatt-hours.
Ky.—Kentucky.

**L**

L—fifty; *libra,* pound (English money).
l.—line; liter.
La.—Louisiana; lanthanum.
Lam.—Lamentations.
lat.—latitude.
lb.—*libra,* pound.
l.c.—lower case (type).
L.C.M.—least common multiple.
Lev.—Leviticus.
L.I.—Long Island.
Li—lithium.
Lieut., Lt.—Lieutenant.
Litt. B.—*Litterarum Baccalaureus,* Bachelor of Literature.
Litt. D.—*Litterarum Doctor,* Doctor of Literature.
LL.B.—*Legum Baccalaureus,* Bachelor of Laws.
LL.D.—*Legum Doctor,* Doctor of Laws.
LL.M.—*Legum Magister,* Master of Laws.
loc. cit.—*loco citato,* in the place cited.
log.—logarithm.
Lu—lutecium.
LXX—Septuagint Version.

**M**

M.—Monsieur; *meridies,* noon; *mille,* one thousand; meter.
M.A.—*Magister Artium,* Master of Arts.
Ma.E.—Master of Engineering.
Maj.—Major.
Mal.—Malachi.
Mar.—March.
Mass.—Massachusetts.
Matt.—Matthew.
M.B.—*Medicinae Baccalaureus,* Bachelor of Medicine; Bachelor of Music.
M.C.—Master in Surgery; Member of Congress.
M.C.E.—Master of Civil Engineering.
M.D.—*Medicinae Doctor,* Doctor of Medicine.
Md.—Maryland.
M.D.S.—Master of Dental Surgery.
mdse.—merchandise.
M.E.—Mining (or Mechanical) Engineer; Methodist Episcopal.
Me.—Maine.
Messrs.—*Messieurs,* Gentlemen, Sirs.
mf.—*mezzo forte,* moderately loud.
mfg.—manufacturing.
mfrs.—manufacturers.
Mg—magnesium.
mg.—milligram.
Mgr.—Monsignor.
Mic.—Micah.
Mich.—Michigan.
Minn.—Minnesota.
Miss.—Mississippi.
Mlle.—Mademoiselle.
MM.—Messieurs.
mm.—millimeter (mm.², square millimeter; mm.³, cubic millimeter).
Mme.—Madame.
Mn—manganese.
Mo.—Missouri; molybdenum.
Mon.—Monday.
Mont.—Montana.
M.P.—Member of Parliament; Military Police.
m.p.h.—miles per hour.
M.R.A.S.—Member of the Royal Academy of Science; Member of the Royal Asiatic Society.
M.R.C.P.—Member of the Royal College of Physicians.
M.R.C.S.—Member of the Royal College of Surgeons.
M.R.G.S.—Member of the Royal Geographical Society.
M.R.I.—Member of the Royal Institution.
MS.—Manuscript (plural, MSS.).
Mt.—Mount, Mountain.
Mus.B.—*Musicae Baccalaureus,* Bachelor of Music.
Mus.D.—*Musicae Doctor,* Doctor of Music.
M.V.O.—Member of the Victorian Order.

**N**

N.—North; nitrogen.
Na—sodium.
Nah.—Nahum.
N.B.—*nota bene,* note well; New Brunswick.
N.C.—North Carolina.
N.D.—North Dakota.
Nd—neodymium.
N.E.—New England; northeast.
Ne—neon.
Neb.—Nebraska.
Neh.—Nehemiah.
nem. con.—*nemine contradicente,* "no one contradicting," unanimously.
Nev.—Nevada.
N.F.—Newfoundland.
N.G.—National Guard; no good (slang).
N.H.—New Hampshire.
Ni—nickel.
N.J.—New Jersey.
N.M., N. Mex.—New Mexico.

**Acapulco** (*ä-kȧ-pụl'kō*), Mex. seaport on Pacific, 190 mi. s. w. of Mexico City; pop. 6000; exports copper, fruit, hides; **2209.**
**Acari'na,** an order of arachnids including mites, **3946.**
**Accelera'tion,** in mechanics, **2190.**
**Accel'erator,** automobile, **278.**
**Accipitres** (*ăk-sĭp'ĭ-trēz*). Another name for the *Raptores.*
**Acceptance** or **trade acceptance.** A promissory note arising from the sale or purchase of goods, thus distinguished from ordinary notes, which may be given for obligations of any character.
**Accessory food substances** or vitamins, **3651–2.**
**Acclimatiza'tion,** of animals, *picture,* **397.**
**Accolade** (*ăk-ō-lād'*), **1934.**
**Accordion** (*ă-kôr'dĭ-ŏn*), **2383;** *picture,* **2382.**
**Accountancy,** as a vocation, **7.**
**Accounts** and bookkeeping, **5–7.**
**Ace** (war term), **3248.**
**Acer** (*ā'sẽr*), the maple genus of trees, **2138.**
**Acetan'ilid,** a drug used in headache powders and as a febrifuge; obtained from coal-tar, **1042.**
**Acetate** (*ăs'ĕ-tāt*), a salt of acetic acid; cellulose, **673;** lead ("sugar of lead"), **1779, 2642, 3644.**
**Acet'ic acid,** in vinegar, **3644;** composition, **642;** uses, **10, 673.**
**Ac'etone,** an organic compound used as a solvent, **8, 906.**
**Acetylene** (*ȧ-sĕt'ĭ-lēn*), an illuminating gas, **7–8, 571;** smoky flame, **3253;** in welding, **3716.**
**Achaea** (*ȧ-kē'ȧ*), district of Greece on n. coast of Peloponnesus; Achean League, a confederation of its anc. towns, crushed by Rome 146 B.C.; *map,* **1518.**
**Achates** (*ȧ-kā'tēz*). In Vergil's 'Aeneid', Trojan hero noted for loyalty to Aeneas; hence phrase *fidus Achates,* "faithful Achates."
**Achеans** (*ă-kē'ănz*), one of the main divisions of the anc. Greeks, **1520.**
**A'chernar,** a star, **3342.**
**Acheron** (*ăk'ĕ-rŏn*). In Gk. myth., river of underworld; also the underworld in general.
**Ach'eson, Edward G.** (born 1856), Amer. chemist, **784, 3234.**
**Achilles** (*ȧ-kĭl'ēz*), Gk. hero of Trojan War, **8, 3542, 3543;** and Amazons, **106;** slays Hector, **1626–7;** story of his shield, **9.**
**Achilles tendon,** **1322;** origin of name, **8.**
**Achinese** (*ăch-ĭ-nēz'*), natives of Achin or Atcheen, a former native kingdom, now Dutch province Atjeh, at n. end of Sumatra; of shorter stature and darker color than other Sumatrans; wars with Dutch, **3391.**
**Achro'matism,** of reflecting telescope, **3566.**
**Acids, 8, 10;** formed by metals, **2201;** in digestion, **3360;** hydrogen in, **1710, 4043;** litmus test, **2030;** organic, **4043;** poisonous, **2854;** in soil, **89;** why some names end in "ic" and some in "ous," **4043.**
**Acids,** acetic, **3644;** benzoic, **814;** carbolic, **641–2, 814, 4044;** carbonic, **642;** citric, **1986;** fatty, in soap-making, **3263, 3267;** hydrochloric (muriatic), **1710, 755;** hydrocyanic

## LIST OF ABBREVIATIONS *(Concluded)*

No.—*numero,* number.
non-com. — non-commissioned officer.
non seq.—*non sequitur,* it does not follow.
Nov.—November.
N.P.—Notary Public.
N.S.—New Style; Nova Scotia.
N.S.W.—New South Wales.
N.T.—New Testament.
Num.—Numbers.
N.W.—Northwest.
N.W.T.—Northwest Territory.
N.Y.—New York.

**O**

O.—Ohio; oxygen.
ob.—*obiit,* died.
Obad.—Obadiah.
Oct.—October.
O.K.—all correct (slang).
Okla.—Oklahoma.
O.M.—Order of Merit.
Ont.—Ontario.
O.F.—Odd Fellow.
op. cit.—*opere citato,* in the work cited.
Ore.—Oregon.
O.S.—Old Style.
Os—osmium.
O.T.—Old Testament.
Oxon.—*Oxoniensis,* of Oxford.
oz.—*onza,* ounce.

**P**

P—phosphorus.
p.—*piano,* soft; page.
Pa.—Pennsylvania.
Pb—lead.
P.C.—Privy Council; Privy Councilor.
pct.—*per centum,* by the hundred.
Pd—palladium.
P.E.I.—Prince Edward Island.
Penn.—Pennsylvania.
Pet.—Peter.
pf.—preferred.
p.f.—*piu forte,* a little louder.
Pharm. D.—Doctor of Pharmacy.
Ph.B.—*Philosophiae Baccalaureus,* Bachelor of Philosophy.
Ph.D.—*Philosophiae Doctor,* Doctor of Philosophy.
Ph.G.—Graduate in Pharmacy.
Phil.—Philippians.
Phila.—Philadelphia.
P.I.—Philippine Islands.
pkg.—package.
P.M.—Past Master; postmaster; *post meridiem,* after noon.
P.O.—Postoffice; Province of Ontario.
P.P.—Parcel Post.
pp.—*pianissimo,* very soft; pages.
P.P.C.—*Pour prendre congé,* to take leave.
P.R.—Porto Rico.
Pr—praseodymium.
Prof.—Professor.
pro tem.—*pro tempore,* for the time being.
Prov.—Proverbs; Province.
prox.—*proximo,* next month.
P.S.—*post scriptum,* postscript.
Ps.—Psalms.
Pt.—Point; Port; Part; platinum.
pwt.—pennyweight.

**Q**

Q.E.D.—*quod erat demonstrandum,* which was to be shown.
Q.E.F.—*quod erat faciendum,* which was to be done.
ql—quintal.
Q.M.G.—Quartermaster-General.
qt.—quart.
Que.—Quebec.
q.v.—*quod vide,* which see.

**R**

R.—*rex,* king; *regina,* queen.
R.A.—Royal Academy; Royal Artillery; Rear-Admiral.
Ra—radium.
R.A.M.—Royal Academy of Music; Royal Arch Mason.
R.A.M.C.—Royal Army Medical Corps.
Rb—rubidium.
Rev.—Reverend; Revelations.
R.F.D.—Rural Free Delivery.
Rh—rhodium.
R.I.—Rhode Island.
R.I.P.—*Requiescat in pace,* may he rest in peace.
rit., ritard. — *ritardando,* gradually slower.
riten.—*ritenuto,* retarding.
R.M.S.—Royal Mail Steamer.
R.N.—Royal Navy; Registered Nurse.
R.N.W.M.P.—Royal Northwest Mounted Police.
R.R.—Railroad.
R. S. V. P.—*Respondez, s'il vous plait,* Answer, if you please.
Rt.Hon.—Right Honorable.
Rt.Rev.—Right Reverend.
Ru—ruthenium.
R.V.—Revised Version (of the Bible).
Ry.—Railway.

**S**

S.—South; sulphur.
s.—*solidus,* a shilling (English money).
Sa—samarium.
Sam.—Samuel.
S.A.R.—Sons of the American Revolution.
Sask.—Saskatchewan.
Sat.—Saturday.
S.B.—Bachelor of Science.
Sb—antimony.
S.C.—South Carolina.
Sc—scandium.
sc.—*scilicet,* that is to say.
Sc.B.—*Scientiae Baccalaureus,* Bachelor of Science.
Sc.D.—*Scientiae Doctor,* Doctor of Science.
S.D.—South Dakota.
Se—selenium.
Sept.—September.
seq.—*sequentia,* the following.
Si—silicon.
S.J.—Society of Jesus (Jesuits).
Sn—tin.
S.O.S.—Service of supply; also used as a wireless distress signal.
S.P.C.A.—Society for the Prevention of Cruelty to Animals.
S.P.C.C.—Society for the Prevention of Cruelty to Children.
sp.gr.—specific gravity.
S.P.Q.R.—*Senatus Populusque Romanus,* the Roman Senate and People.
Sr.—Senior; strontium.
S.R.S.—*Societatis Regiae Socius,* Fellow of the Royal Society.
SS.—Steamship.
St.—Saint; Strait; Street.
S.T.B.—*Sacrae Theologiae Baccalaureus,* Bachelor of Sacred Theology.
S.T.D.—*Sacrae Theologiae Doctor,* Doctor of Sacred Theology.
S.T.P.—*Sacrae Theologiae Professor,* Professor of Sacred Theology.
Sun.—Sunday.
s.v.—*sub voce,* under the heading.

**T**

Ta—tantalum.
Tb—terbium.
Te—tellurium.
Tenn.—Tennessee.
Tex.—Texas.
T.H.—Territory of Hawaii.
Th—thorium.
Thess.—Thessalonians.
Thurs.—Thursday.
Ti—titanium.
Tim.—Timothy.
Tl—thallium.
Tm—thulium.
Tues.—Tuesday.
twp.—township.

**U**

U—uranium.
U.E.L.—United Empire Loyalist.
U.K.—United Kingdom.
ult.—*ultimo,* last month.
U.S.A.—United States Army; United States of America.
U.S.M.—United States Mail; United States Marines.
U.S.N.—United States Navy.
U.S.P.—United States Pharmacopoeia.
U.S.S.—United States Ship; United States Steamer.

**V**

V—five; vanadium.
Va.—Virginia.
V.C.—Victoria Cross.
Ven.—Venerable.
V.G.—Vicar-General; Vice-Grand.
V.I.—Vancouver Island.
viz.—*videlicet,* namely.
vol.—volume.
V.S.—Veterinary Surgeon.
vs.—*versus,* against; verse.
Vt.—Vermont.

**W**

W.—West; tungsten.
Wash.—Washington.
W.C.T.U.—Woman's Christian Temperance Union.
Wed.—Wednesday.
Wis.—Wisconsin.
W. S. P. U.—Women's Social and Political Union.
wt.—weight.
W. Va.—West Virginia.
Wyo.—Wyoming.

**X**

X—ten.
Xe—xenon.
Xmas—Christmas.

**Y**

Yb—ytterbium.
yd.—yard.
Y.M.C.A.—Young Men's Christian Association.
Y.P.S.C.E.—Young People's Society of Christian Endeavor.
yr.—year.
Yt—yttrium.
Y.W.C.A.—Young Women's Christian Association.

**Z**

Zech.—Zechariah.
Zeph.—Zephaniah.
Zn—zinc.
Zr—zirconium.

(prussic), **944, 2855;** hydrofluoric, **755;** lactic, **2239;** nitric, **2510–1, 1050;** picric, **814, 1212;** salicylic, **814;** silicic, **3234;** sulphuric, **3390;** tannic, **1975–6;** tartaric, **3438.**

**Aclin'ic Line** or **Magnetic Equator.** An imaginary irregular line around the earth, near geographical equator, marking perfect balance between attraction of North and South Magnetic Poles; at any point on this line the compass needle does not dip.

**Ac'ne,** or pimples, cause, **3652.**

**Acoma** (*ȧ-kō'mȧ*), N. M., anc. Indian village, **2464.**

**Aconcagua** (*ä-kōn-kä'gwȧ*), highest peak of Andes (22,860 ft.), **10, 123, 3284;** also r. and province in Chile.

**Ac'onite** or **aconi'tum,** a genus of about 70 species of poisonous plants of the crowfoot family, including some medicinal species; also called monk's hood, from large showy flowers with hooded sepals; **2855,** *picture,* **2853;** antidote, **1270.**

**Acon'itin,** poison, **2855.**

**Acorn,** fruit of oak tree, **2547.**

**Acorn-shell,** a barnacle, **331.**

**Acoustics** (*ȧ-kus'tiks* or *ȧ-kous'tiks*), science of sound, **3278, 2786.**

**Acre** (*ā'kẽr* or *ā'kẽr*), seaport of Syria; pop. 10,000; taken by Richard the Lion-Hearted in 3d Crusade (1191), **930, 3015;** surrendered to Turks, **932;** Napoleon's defeat, **2393;** taken by British (1918), **3807.**

**Acre,** unit of land measure (160 sq. rods), **3715;** origin of name, **3714.**

**Acres** (*ā'kẽrz*), **Bob.** In Sheridan's comedy 'The Rivals', a swaggering coward.

**Acridiidae** (*ăk-ri-dī'ĭ-dē*), the locust family, **1506.**

**Acrisius** (*ă-krĭs'ĭ-ŭs*), in Gk. myth., king of Argos, grandfather of Perseus, **2731, 2732.**

**Acrocorin'thus,** citadel of Corinth, **1520.**

**Acropolis** (*ȧ-krŏp'ō-lĭs*), in anc. Greece, **1520;** of Thebes, **3485.**

**Acropolis of Athens, 10–12, 249, 251;** *pictures,* **250, 1516, 1517, 1527;** statue of Athena, *picture,* **248.**

**Acteon** (*ăk-tē'ŏn*), in Gk. myth., hunter who spied on Diana bathing, **220–1.**

**Actinism** (*ăk'tĭn-ĭzm*), property of light by which chemical changes are produced; makes photography possible, **2778.**

**Actin'ium,** a substance occurring in pitchblende; radioactive properties, **2961.**

**Actin'olite,** roofing material, **531.**

**Actinolite,** variety of asbestos, **225.**

**Actinozo'a,** a class of coelenterates, **3944.**

**Actium** (*ăk'shĭ-ŭm*) (now Akri), promontory of n. w. Greece; battle of (31 B.C.), **789, 258.**

**Act of Union** (of 1707), unites Scotland to England, **1510, 3149;** (of 1801), Ireland, **1510, 1810, 2559.**

**Ac'ton, John Emerich,** first **Baron** (1834–1902). Eng. historian and editor; led liberal Cath. movement in England; opposed doctrine of papal infallibility.

**Actors and acting.** *See in Index* **Drama.**

**Acts of the Apostles,** 5th book of New Testament giving history of Church from ascension of Christ to imprisonment of St. Paul in Rome; authorship **157.**

**Acushnet** (*ȧ-kụsh'nĕt*) **River,** Mass., **2449.**

**Ada** (*ā'dȧ*), Okla. City 75 mi. s.e. of Oklahoma City, pop. 8012; state normal school; cement, asphalt.

**Adagio** (*ä-dä'ġō*), in music, **2379.**

**Ada'lia.** Seaport in s. Asia Minor; important trade center; pop. 30,000.

**Adam** (*ăd'ȧm*), first created man; in Milton's 'Paradise Lost', **2245–6.**

**Adam, Robert** (1728–92), Brit. architect and furniture-maker, most celebrated of four brothers; inaugurated new style of interior decoration; **1384, 1385.**

**Adamawa** (*ȧ-dä-mä'wä*). Former native kingdom of w.-cent. Africa, divided between Nigeria and Cameroon; largely mountainous, with thick forests; 50,000 sq. mi.

**'Adam Bede',** novel by George Eliot, **1134.**

**Adams, Abigail** (1744–1818), wife of John Adams, **12,** *picture,* **13.**

**Adams, Abraham** ("Parson"). In Fielding's 'Joseph Andrews', eccentric good-hearted country curate, unsuspecting and ignorant of the world.

**Adams, Brooks** (born 1848), lawyer and author ('The Law of Civilization and Decay'), **12.**

**Adams, Charles Francis** (1807–86), Amer. minister to Great Britain during Civil War, **12, 73,** *picture,* **13.**

**Adams, Charles Francis, Jr.** (1835–1915), soldier, historian, and r. r. president, **12.**

**Adams, Henry** (1838–1918), historian, b. Boston, Mass. ('History of the United States, 1801–17'; 'The Education of Henry Adams'); **12.**

**Adams, John** (1735–1826), 2d president of U. S., **12–14;** and James Otis, **2604;** defends soldiers in Boston Massacre, **12, 3001;** and Declaration of Independence, **13, 975;** negotiates treaty of peace with Great Britain, **13, 3004.**—*Administration:* party split, **13, 1882;** XYZ Affair and naval war with France, **14, 3826;** Alien and Sedition laws, **14, 2107, 3347;** relations with John Marshall, **2155;** capital removed to Washington, **3683.**

**Adams, John** (1760–1829), assumed name of Alexander Smith, one of the mutineers of the *Bounty,* **2624.**

**Adams, John Couch** (1819–92), Eng. astronomer, one of the discoverers of Neptune, **245, 246–7, 2818.**

**Adams, John Quincy** (1767–1848), 6th president of U. S., **14–16,** *picture,* **13;** early career, **14–15;** secures neutralization of Great Lakes, **1514;** helps frame Monroe Doctrine, **2307;** elected president, **15, 785, 1856.**—*Administration:* beginning of Whig and Democratic parties, **15;** Erie Canal built, **627;** first r.r. built, **2963;** tariff, **575.**

**Adams, Maude,** stage name of **Maude Kiskadden** (born 1872), Amer. actress, b. Salt Lake City ('Peter Pan'; 'What Every Woman Knows'; 'Chantecler', etc.); as 'Peter Pan', *picture,* **1036.**

**Adams, Samuel** (1722–1803), Amer. Revolutionary patriot and statesman, **16, 1990, 470,** *picture,* **13.**

**Adams, Samuel Hopkins** (born 1871). Amer. author and editor, b. Dunkirk, N. Y.; his articles in *Collier's Weekly* led to reforms in the patent medicine business ('Average Jones'; 'The Secret of Lonesome Love').

**Adams, William Taylor.** *See in Index* **Optic, Oliver.**

**Adams,** Mass. Mfg. town in n.w., on Hoosac R.; pop. 12,967; contains Greylock Mt. (3535 ft.), highest point in state.

**Adams, Mt.,** peak of Cascade Mts. in s.w. Wash.; 12,470 ft.; **3687, 2885.**

**Adam's apple, 3657.** So named from tradition that when Adam tried to swallow the apple it stuck in his throat.

**Adamson Law, 3747.**

**Adam's Peak,** mt. in Ceylon; 7379 ft.; pilgrim resort of Buddhists, Hindus, Mohammedans; **684.**

**Adana** (*ä-dä'nä*), city and vilayet in s.e. Asia Minor; pop., city, 45,000, vilayet, 425,000; strategic location near passes of Taurus Mts.; ceded to Italy, **1661.**

**Adapa** (*ä'dä-pä*), in Babylonian myth., **299.**

**Adapta'tion,** in biology, **1076, 1210, 127;** alpaca, **100;** birds, **400–1;** extinction of giant reptiles, **136, 2038, 1420;** fishes, **1274, 1289–90;** giraffe, **1463–4;** plants, **2826–9, 3700, 562, 855;** protective coloration, **2923–6, 685.**

**Addams, Jane** (born 1860), Amer. social worker, founder of Hull House, **16–18, 3269.**

**Ad'dax** or **addas.** An antelope of N. Africa, and Arabia; about 3 ft. high, yellowish white in color with shaggy brown hair on throat and forehead; both sexes have long spirally twisted horns.

**Adder,** or common viper, **3647.**

**Adder's-tongue,** another name for dogtooth violet, **1025.**

**Adding machine, 572, 196.**

**Addis Abeba** (*ä'dis ä-bā'bä*), cap. of Abyssinia; pop. 35,000; treaty of peace (1896) between Italy and Abyssinia; **3.**

**Addison, Joseph** (1672–1719), Eng. poet and essayist, incomparable stylist ('Sir Roger de Coverley' papers in *The Spectator,* gentle cheerful satire and shrewd observation of human nature); **1165, 1166, 1178, 3406.**

**Addition, 18–24;** in algebra, **94;** decimals, **971–2, 973;** fractions, **1339.**

**Address, forms of.** Custom has established forms to be used in addressing persons of high rank or official position. Among those in common use are:

*Ambassador:* "His Excellency the —— Ambassador." Begin letter: "Your Excellency."

*Archbishop:* "His Grace the Lord Archbishop of ——" (in England); "His Grace the Archbishop of ——" (in U. S.). Begin letter: "My Lord Archbishop"; "Your Grace."

*Army Officer:* "Colonel ——, U. S. A." Begin letter: "Sir."

*Bishop:* "The Right Reverend ——, Bishop of ——" (Prot. Episc. and Rom. Cath.); "The Reverend Bishop ——" (Meth. Episc.). Begin letter: "Right Reverend Sir," or "Dear Sir."

*Cabinet Officer:* "The Honorable the Secretary of ——," or "The Honorable ——, Secretary of ——." Begin letter: "Sir," or "Dear Sir."

*Cardinal:* "His Eminence Cardinal ——." Begin letter: "Your Eminence," or "Most Eminent Sir."

*Governor:* "His Excellency the Governor of ——," or "Honorable ——, Governor of ——." Begin letter: "Sir," or "Dear Sir."

*King:* "To His Most Gracious Majesty, King ——," or "His Majesty the King." Begin letter: "Sir," or "May it please your Majesty."

*Mayor:* "The Honorable ——, Mayor of ——." Begin letter: "Sir," or "Dear Sir."

*Member of House of Representatives:* "The Honorable ——." Begin letter: "Sir," or "Dear Sir."

*Member of Parliament:* "The Honorable ——, M. P." Begin letter: "Sir," or "Dear Sir."

*Naval Officer:* "Captain ——, U. S. N." Begin letter: "Sir."

*Pope:* "His Holiness the Pope." or "Our Most Holy Father, Pope ——." Begin letter: "Most Holy Father."

*President:* "The President of the United States," "His Excellency the President of the United States," or "President ——." Begin letter: "Mr. President," or "Sir."

*Queen:* "To Her Most Gracious Majesty, Queen Mary," or "Her Majesty the Queen." Begin letter: "Madame," or " May it please your Majesty."

*Senator:* "Senator ——," or "The Honorable ——." Begin letter: "Sir," or "Dear Sir."

*Vice-President:* "The Vice-President ——," or "The Honorable ——, Vice-President of the United States." Begin letter: "Sir," or "Dear Sir."
*Viceroy:* "His Excellency the Viceroy of India." Begin letter: "Sir," or "My Lord."

**Adduc'tor muscle,** of scallop, **3134;** of oyster, *picture,* **2615.**

**Ade** (*ād*), **George** (born 1866), Amer. humorist and playwright, b. Kentland, Ind.; noted for apt use of language of street ('Fables in Slang'; 'The Sultan of Sulu'; 'The College Widow'; 'The County Chairman'); made mark as writer of 'Stories of the Streets and of the Town' for Chicago *Record;* quoted, **1757.**

**Adelaide** (*ăd'ĕ-lād*), cap. and trade center of S. Australia, 3d largest city of dominion; 7 mi. from sea on Torrens R.; pop. 50,000; wool, leather, iron, earthenware mfrs.; Adelaide Univ.; **268.**

**Adel'phi College.** Co-ed. non-sectarian institution at Brooklyn, N. Y.; founded 1896; arts and sciences with special view to teachers' preparation.

**Aden** (*ä'dĕn*), Brit. colony on s. w. coast of Arabia; pop. 50,000; **24,** *map,* **232–3.**

**Adenoids** (*ăd'ĕ-noidz*), excessive growth of tissue in the nasal pharynx, **1714.**

**Adige** (*ä'dē-jā*) **River,** n. Italy, rises in Tyrolese Alps and empties into Gulf of Venice, **1835, 3539, 3573, 3623.**

**Adirondack** (*ăd-ĭ-rŏn'dăk*) **Mts.,** in n.e. New York, **25,** *pictures,* **2481;** black bears, **350.**

**Ad'jective,** 25, **1494;** phrase or clause as, **3175.**

**Ad'jutant,** a large East Indian stork, **3362, 3365,** *picture,* **3363.**

**Adjutant-General,** U.S.A., **218, 3599;** dept. insignia, *picture,* **3576.**

**Adler** (*ăd'lĕr*), **Felix** (born 1851), Amer. lecturer and author; b. Germany; founded (1876) in N. Y. the Society for Ethical Culture; **1892.**

**Admetus** (*ăd-mē'tŭs*). In Gk. myth., king of Pherae in Thessaly. *See in Index* **Alcestis.**

**Ad'mirable Crichton** (*krī'tŏn*). *See in Index* **Crichton.**

**Ad'miral,** highest grade in U. S. Navy, **2426;** held by Farragut, **1224,** Porter, **2884,** Dewey, **1001;** insignia, *picture,* **3577.**

**Ad'miralty.** Dept. of Brit. govt. having, under Parliament, supreme charge of naval affairs; administrative board composed of three naval or sea lords of admiralty and two civil lords.

**Admiralty Islands,** group of small isls. in Bismarck Archipelago; pop. 4000; coconuts, pearls; mandatary of Australia; native canoes, *picture,* **2618.**

**Adobe** (*ȧ-dō'bē*). sun-dried brick, or the clay of which bricks are made, **503, 785.**

**Adolescence** (*ăd-ō-lĕs'ĕns*), the period of transition from childhood to adult life, **25–6;** change of voice, **3657.**

**'Adona'is',** elegy by Shelley on death of Keats, **3204.**

**Adonis** (*ȧ-dō'nĭs*), in Gk. myth., a youth beloved of Aphrodite, **26.**

**Adowa** (*ä'dȯ-wȧ*), town in Abyssinia; Italians defeated in 1896, **3.**

**Adrastus** (*ȧ-drăs'tŭs*), in Gk. myth., king of Argos, **2566.**

**Adre'nalin,** astringent drug from adrenal gland of cattle, **1470, 1042.**

**A'dria,** Italy, **26.**

**A'drian,** popes. For list *see in Index* **Pope.**

**Adrian I,** pope 772–795 A.D., invited Charlemagne to invade Italy, **2047.**

**Adrian IV** (1100?–59). Nicholas Breakspeare, only Eng. pope; elected 1154; quarreled with Emperor Frederick Barbarossa, initiating long contest between papacy and house of Hohenstaufen.

**Adrian VI** (1459–1523), became pope 1522 through influence of his ex-pupil Emperor Charles V; house in Utrecht, **3612.**

**Adrian,** Mich. City on Raisin R. 30 mi. n. w. of Toledo, Ohio; pop. 11,878; wire fence, steel castings, condensed milk, knit goods.

**Adrian College.** Co-ed. Meth. Episc. institution at Adrian, Mich.; organized 1859; literature and arts, music, fine arts, manual training, theology, business.

**Adrianople** (*ăd-rĭ-ȧ-nō'pl*) ("Hadrian's City"), chief city of Thrace; pop. 80,000; **26.**

**Adrianople, Peace of** (1829), between Russia and Turkey, secured Gk. independence, **1526.**

**Adriatic** (*ā-drĭ-ăt'ĭc*) **Sea,** an arm of the Mediterranean, e. of Italy, **26, 2194;** Italy's claims, **3812.**

**Adul'lam, Cave of, 967.**

**Adultera'tion,** of candy, **630;** clothing, **3782;** coffee, **823;** pure food laws, **2936–7;** vinegar, **3644.**

**Ad'verb, 26, 1494;** conjunctive, **862;** phrase or clause as, **3175.**

**Advocates' Library** (Edinburgh), **1082.**

**Æ,** pen name of George W. Russell (born 1867), Irish lyric poet, essayist, painter, and Nationalist leader ('The Earth-Breath and Other Poems'; 'Deirdre'); **1814.**

**Aegean** (*ē-ǰē'ăn*) **civilization** (flourished (3000–1200 B.C.), in Crete and neighboring isls. and mainland, **27–9, 918–9;** architecture, **176–7;** costumes, *picture,* **898;** history, chief events summarized, **1655;** in Homer's poems, **1676;** influence on Gk. civilization, **1520;** ivory carvings, **3156;** remains at Troy, **3543;** ships, **3207.**

**Aegean Sea,** arm of Mediterranean between mainland of Greece and Asia Minor, **27, 1517,** *map,* **27;** origin of name, **3487.**

**Aegeus** (*ē'ǰụs*), mythical king of Athens, **3487.**

**Aegina** (*ē-ǰī'nȧ*), isl. in Saronic Gulf 15 mi. s. w. of Athens; 40 sq. mi.; important anc. state; conquered by Athens 458 B.C.; **1528.**

**Aegis** (*ē'ǰĭs*), in Gk. myth, breast plate of Zeus, **3839.**

**Aegisthus** (*ē-ǰĭs'thŭs*). In Gk. myth., son of Thyestes and adopted son of Atreus, whom he slew; aided Clytemnestra in slaying of Agamemnon, his cousin.

**Aegospotami** (*ē-gŏs-pŏt'ȧ-mī*), anc. name of small stream on Peninsula of Gallipoli, emptying into Hellespont; Athenian fleet captured (405 B.C.), **1525.**

**Aemilian** (*ē-mĭl'ĭ-ȧn*) **Way.** Road in anc. Italy 185 mi. long, Rimini to Milan; built 187 B.C.

**Aeneas** (*ē-nē'ȧs*), fabled ancestor of Romulus and Remus, hero of Vergil's epic 'Aeneid', **29.**

**'Aene'id',** epic poem by Vergil, **3630, 1967, 29:** 'Story of the Wooden Horse', **3543–4.**

**Aeolian** (*ē-ō'lĭ-ȧn*) **harp, 30.**

**Aeolian Islands.** *See in Index* **Lipari Islands.**

**Aeolians,** one of the four great divisions of the Gk. race, **1520.**

**Aeolian soil, 3273.**

**Aeol'ic dialect, 1538.**

**Ae'olus,** in Gk. myth., ruler of the winds, **29–30, 767.**

**Aepinus** (*ā-pē'nus*), **Francis** (1724–1802), Ger. physicist, improved microscope, discovered electric properties of tourmaline; and magnetism, **1118.**

**Aequians** (*ē'kwĭ-ănz*), Italic tribe, Romans war against, **766–7, 3044.**

**Aerials** (*ā-ē'rĭ-ălz*), or antennae, in radio telegraphy and telephony, **3760, 3761, 3766.**

**Aerodrome** (*ā'ēr-ō-drōm*), flying-machine, **56.**

**Aerofoils** (*ā'ēr-ō-foilz*), airplane, **65.**

**Aërolite** (*ā'ēr-ō-līt*), or meteorite, **2202.**

**Aeronau'tics.** *See in Index* **Airplane; Balloon.**

**Aeschines** (*ĕs'kĭ-nēz*) (389–314 B.C.), Athenian orator and statesman, **993, 1537.**

**Aeschylus** (*ĕs'kĭ-lŭs*) (525–456 B.C.), first great tragic dramatist of Greece, **1536, 1032;** chief works, **1038, 2921, 1382.**

**Aesculapius** (*ĕs-kū-lā'pĭ-ŭs*) or **Asclepius,** in Gk. and Rom. myth., god of medicine, son of Apollo; his staff with a serpent coiled round it is often used as medical insignia; **679, 2193, 3257.**

**Aesop** (*ē'sŏp*) (620?–560? B.C.), Gk. writer of fables, **30–1.**

**Aesthetics** (*ĕs-thĕt'ĭks*), branch of philosophy, defined, **2773.**

**Aetius** (*ā-ē'shĭ-ŭs*) (d. 454), Rom. general, savior of Europe by his victory (451) over Attila at Chalons; murdered by Valentinian III; **1704.**

**Aetna, Mt.** Same as **Etna, Mt.**

**Aetolia** (*ē-tō'lĭ-ȧ*), district of Greece n. of Gulf of Corinth; Aetolian League became chief rival of Achean League in the 4th and 3d cents. B.C.; *map,* **1518.**

**Af'ferent nerves, 2437.**

**Affinity,** chemical, **712, 256.**

**Afghan greyhound,** *picture,* **1022.**

**Afghanistan** (*ăf-găn-ĭ-stăn'*), mountainous inland country of Asia between India and Persia; pop. 6,400,000; nearly as large as Texas; **31,** *maps,* **31, 232–3;** ancient trade route, **1751;** Khyber Pass, **31, 1744;** people, *picture,* **1748.**

**Afghan Wars, 31, 3027.**

**Africa,** the 2d largest continent; 11,262,000 sq. mi.; pop. 170,000,000; **32–41,** *maps,* **40–1,** *Study Outline,* **3914–8.**
Animals, **34, 36;** climate, **34, 40;** deserts, **33, 3104–6;** extent and coastline, **32, 33, 1578;** E. Africa, **1068–70;** elevation, **2791,** *map* facing **40;** former land connection with Asia, **2106,** with Europe, **3299;** insects, **1788, 2334, 3546–7, 142;** mountains and plateaus, **33, 34, 36;** native races, **36–7, 2434;** population, **37,** *map* facing **40;** rainfall, *map* facing **40;** religion, **37, 2278, 2993;** resources and products, **34, 37, 40–1;** rivers and lakes, **32, 34, 36, 41;** slavery, **3249, 3250;** S. Africa, **3279–83;** Sudan. **3384;** transportation, **41;** vegetation, **34, 40,** *map* facing **40.** —*History:* ancient civilization, **32** (*see also in Index* **Carthage; Egypt);** Vandal kingdom, **3617–8;** Mohammedan conquest, **2276;** circumnavigated by Portuguese, **36, 3279, 1392–3, 1638–9;** modern exploration, **38, 2033–5, 3338–9;** growth of Brit. power, **513, 3279–82;** partitioned by Europeans, **40.** *See also in Index* chief rivers, political divisions, and cities.

**African elephant, 1126, 1128,** *picture,* **1129.**

**Afridi** (*ȧ-frē'dē*), people of Afghanistan, **31.**

**Afrikan'der Bond, 3282.**

**Agadir** (*ä-ḡä-dēr'*), Morocco, Germany sends warship to, **2327.**

**Agamemnon** (*ăḡ-ȧ-mĕm'nŏn*), in Gk. myth., king of Mycenae, leader of Greeks in the Trojan War; brother of Menelaus; murdered by his wife Clytemnestra; **3543, 8, 1382.**

**Agana** (*ä-ḡä'nyä*), cap. of Guam; pop. 8,000, **1545.**

**Agassiz** (*ăḡ'ȧ-sē*), **Alexander** (1835–1910), Amer. scientist, **42.**

**Agassiz, Louis Jean Rodolphe** (1807–73), Swiss-Amer. naturalist and geologist, **41–2.**

**Agassiz, Lake,** glacial lake in N. Amer., **1721, 2790, 2986;** in Manitoba, **2136;** Minn., **2253.**

**Ag'ate,** a semi-precious stone, **1409, 1411, 2945;** silica base, **3233.**
**Agateware, 1148.**
**Ag'atha, Saint.** Patron saint of Malta; a noble Sicilian woman who was martyred about 251 A.D.
**Agave** (*à-gā'vē*), a genus of Amer. plants of the amaryllis family, **42;** use in Mexico, **2213,** *picture,* **2215.**
**Ageratum** (*à-jĕr'à-tŭm*). A genus of flowering plants of the Aster family much used for garden borders.
**Agglu'tinative languages, 2771.**
**Agincourt** (*ă-zhăn-kŭr'*), village in n. France; decisive battle of Hundred Years' War (1415), **42, 1700,** *picture,* **1635;** results, **1634.**
**Aglaia** (*à-glā'yà*), in Gk. myth., one of the three Graces, **155.**
**Agnes, Saint.** Virgin martyr (304 A.D.), patron saint of young girls; symbol, a lamb.
**Agnes Scott College.** At Decatur, Ga., a suburb of Atlanta; for women; founded 1889 by Presbyterians; collegiate work, music, art, expression.
**Agora** (*ăg'ō-rà*), market place of anc. Athens, **1524.**
**Agra** (*ä'grä*), anc. city of n. India, 110 mi. s. e. of Delhi; pop. 185,000; contains Taj Mahal and other fine specimens of Mohammedan architecture; r. r. and trade center; **1745;** Taj Mahal, **3429–30,** *picture,* **3431;** tomb of Itimad-ud-daula, *picture,* **1754.**
**Agram** (*ä'grăm*), also **Zagreb** (*zäg'rĕb*), Jugo-Slavia. City 80 mi. n. e. of Fiume, cap. of Croatia-Slavonia; pop. 80,000; linen, carpets, leather; univ.
**Agricola** (*ă-grĭk'ō-là*) (37–93). Rom. general and gov. of Britain (77–84); father-in-law of historian Tacitus, who wrote his life, **1967.**
**Agricola, Georgius** (1490–1555), Ger. mineralogist (*'De re metallica',* first scientific text book on mining and metallurgy); **3839.**
**Agricultural implements, 43–4, 274,** *pictures,* **47, 605, 1631;** harvesting machinery, **2983, 2095, 3493–4;** plow, **2839.**
**Agriculture, 43–9,** *Study Outline,* **4015–18;** ancient, **43, 48, 772, 2830;** in Argentina, **191–2;** bee-keeping, **362, 363;** birds, **401–2, 424, 426** (*see in Index* **Birds, economic value**); blight, **436;** breeding of plants and animals, **44, 46, 48,** *pictures,* **49, 538–9, 2830;** in Canada, **602, 605–10;** climate, **795, 2972–4;** coöperative societies, **879–80, 996;** crop rotation, **2512, 48;** dairying, **949–53;** dry farming, **641, 840;** fertilizers, **1235, 2511–2, 3273, 2898–2900, 2777;** garden crops, **1394–7;** insects, **1788, 3330–1** (*see in Index* **Insects, beneficial and harmful**); irrigation and reclamation, **1827–30;** live stock, **662–3, 3198–3200, 1670–1, 1683–5;** medieval, **48, 2299, 2278, 433;** medieval three-field system, *picture,* **44;** modern methods introduced, **48, 1778;** nitrifying bacteria and legumes, **2511–2, 2829–30, 89, 809, 1235, 302–3,** *pictures,* **810, 302, 89;** orchard crops, **1377–80;** pasture-lands, **1503;** poultry, **2908–11;** primitive methods, in China, **744,** Egypt, *pictures,* **46, 1093, 1094,** Japan, **1864, 3013–5,** Persia, **2736;** rats and mice, **2977–8, 2359;** rusts and smuts, **3099–3101;** silos, **3240;** soil, **3272–3;** teaching of, **47, 830;** in U. S., **3586, 3588, 47–8, 1224;** weeds; **3712–3, 3489–90.** *See also in Index* **Cereal crops, Crop rotation, Fertilizers, Forage crops, Fruits and fruit growing, Gardens and gardening, Live stock, Root crops, Soil,** etc.; *also* under names of political divisions.
**Agriculture, Department of,** U. S., **3597, 3600;** enforces pure food laws, **2937;** established, **791;** Forest Service, **1331,** *pictures,* **1329, 1330;** new plant varieties, **48, 3588;** Weather Bureau, **3707–9.**
**Agrigentum** (*ăg-rĭ-jĕn'tŭm*). Anc. name of Girgenti, Sicily; founded about 582 B.C., ruled by tyrant Phalaris; conquered by Rome 210 B.C.; birthplace of Empedocles; famous ruins.
**Agrippina** (*ăg-rĭ-pī'nà*) (16?–59 A.D.), Rom. empress, wife of Claudius and mother of Nero, **2436, 3050.**
**Aguardiente** (*ä-gwär-dē-ĕn'tā*), a Mexican drink, **2213.**
**Aguascalientes** (*ä-gwäs-kä-lē-čn'-tās*), Mexico. Cap. of state of same name, 270 mi. n.w. of city of Mexico; pop. 45,000; named "hot waters" from medicinal springs for which it is noted; smelting and manufacturing.
**Ague-Cheek** (*ā'gū-chēk*), **Sir Andrew.** In Shakespeare's 'Twelfth Night', comic country squire in love with Olivia.
**Aguinaldo** (*ä-gē-näl'dō*), **Emilio** (born 1872), Filipino leader of rebellion against Spain (1896) and U.S. (1899–1901), **2770, 2104.**
**Agulhas** (*ä-gul'yäs*), **Cape,** southernmost point of Africa, **640.**
**Ahab** (*ā'hăb*). King of Israel 875?–853? B.C.; married Jezebel; rebuked by Elijah for permitting idolatry (I Kings xvi-xxii).
**Ahasuerus** (*à-hăz-ū-ē'rŭs*), anc. king of Persia identified with Xerxes the Great, **1179,** *picture,* **1892.**
**Ahasuerus,** the legendary Wandering Jew, **3668.**
**Ahmadabad** (*ä-mà-dä-bäd'*), India. City 310 mi. n. of Bombay; founded in 1412; pop. 217,000; magnificent temples; silk and cotton mfg.; Rat Guza College.
**Ahmed Mirza** (*ä'mĕd mĭr'zä*) (born 1898). Shah of Persia; succeeded his father, who abdicated in 1909.
**Ahriman** (*ä'rĭ-màn*), in Zoroastrianism, **3841.**
**Ahura** (*à-ho͝o'rà*) **Mazda,** in Zoroastrianism, **3841.**
**Ai** (*ä'ē*), or three-toed sloth, **3252.**
**'Aïda'** (*à-ē'dà*), opera by Verdi; scene laid in anc. Egypt; **2584, 3628, 3384.**
**Aiken** (*ā'kĕn*), **Conrad** (born 1889). Amer. poet, b. in Savannah, Ga. ('Turns and Movies'; 'The Jig of Forslin'; 'Punch').
**Ailanthus** (*ā-lăn'thŭs*), a genus of trees including the Chinese sumach or tree of heaven; valuable for feeding silkworms, **3240.**
**Ailerons** (*ā'lĕ-rŏnz*), airplane, **67.**
**Ain** (*ăn*), river of e. France; rises in Jura Mts., flows s.w. 120 mi. to Rhone; **3012.**
**Aino** (*ī'nō*), or **Ainu** ("man"), an aboriginal race found in northern isls. of Japan; distinct from Japanese and more European than Mongolian in type; **3868.**
**Ainsworth, William Harrison** (1805–82). Eng. writer of historical novels and magazine editor ('Rookwood'; 'Tower of London').
**Aintab** (*în-täb'*), Syria. Military post and trading cent. 70 mi. n.e. of Aleppo; pop. 60,000.
**Air, 50–3;** absorbs moisture, **1207;** carbon dioxide content, **50, 642;** carbon dioxide test, **1716;** composition, **50,** *diagram,* **52;** compressed, **52, 53;** compressed air appliances, **2846–7, 3551–2;** condensation of moisture in, **1000, 809, 1316, 2972;** convection of heat, **1619;** density, **1403;** expanded by heat, **53;** experiments with, **53;** extent of atmosphere, **52,** *picture,* **51;** "fixed" nitrogen from, **53, 2512;** gaseous properties, **1403;** heating, **1621–4,** humidity, **1207, 1622, 1717;** liquid air, **2025;** necessary to life, **50;** nitrogen in, **2511;** oxygen in, **2611–2;** pneumatics, **2847;** pressure, **52, 53, 312;** pressure measured by barometer, **332–3;** pressure used in pumps, **2934,** in siphon, **3243;** purified by plants, **52, 2824;** refrigeration, **2989–92;** resistance, **52, 54–5,** *picture,* **1931;** respiration, **2998–9, 2083;** sound waves in, **3276;** sunlight reflected and refracted by, **52, 3570;** temperature affected by carbon dioxide content, **1721;** vacuum and vacuum appliances, **3614;** ventilation, **1624, 1714, 1716;** weight, **52, 53,** *picture,* **50;** winds, **3750–1.** *See also in Index* **Climate; Meteorology.**
**Air-brake, 492–3, 2966, 3371.**
**Air-brush, 2847.**
**Air currents,** in cloud formation, **809;** in dew formation, **1000;** in fog formation, **1316.** *See also in Index* **Winds.**
**Air cushion,** for elevators, **1132.**
**Aire** (*êr*) **River,** England, tributary of Ouse, **1985.**
**Aire River,** France, rises about 10 mi. w. of St. Mihiel and flows n., along eastern edge of Argonne Forest, to the Aisne; **193, 194.**
**Air-gun, 53.**
**Airplane, 54–68;** basic principles, **64–8, 54, 55,** *picture,* **58;** castor oil best lubricant, **657;** commercial uses, **63;** forest protection, **1331;** Gnôme rotary engine, **58, 1406,** *picture,* **65;** Liberty motor, **60;** parachute, **2674, 63;** radio guides flight, *picture,* **3761;** recent records, **60, 62–3,** *picture,* **51;** spruce wood favored for construction, **3333;** stabilized by the gyroscope, **1555;** transatlantic flights, **62–3, 288;** U.S. postal service, **2898;** in warfare, **58, 60, 61, 216, 2428,** *picture,* **3796.** —*History:* foreseen by Roger Bacon (13th cent.), **301,** by Leonardo da Vinci, **3643;** Langley's experiments, **56;** Wright brothers' success and World War developments, **56–60.**
**Air plants,** or epiphytes, **69;** orchids, **2593.**
**Air pump,** principle, **53;** invented by Guericke, **1117;** used in diving, **1014.**
**Air service, 216, 3599.**
**Airship,** or balloon, **313–20.**
**Air turbine, 3554.**
**Aisin Gioro,** legendary chief of Manchurian clans, **2134.**
**Aisle** (*īl*), in architecture, **180,** *diagram,* **186;** in Egypt. temple, **1102.**
**Aisne** (*ān*), r. in n. France (175 mi.); famous battleground in World War, **69;** in 1914, **3792, 3810;** Fr. attack on (1917), **3797;** in 1918, **3805, 3810;** battle of the Argonne, **193–4.**
**Aix** (*āks*), France. Historic town 18 mi. n. of Marseilles, former cap. of Provence; pop. 20,000; founded 123 B.C.; hot springs; univ. (established 1409).
**Aix-la-Chapelle** (*āks-là-shä-pĕl'*), Fr. name of Aachen, Germany, **1.**
**Aix-la-Chapelle, Treaties of, 1, 2147.**
**Ajaccio** (*ä-yä'chō*), cap. of Corsica; pop. 20,000; naval base during World War; **894, 2391.**
**Ajanta,** India, village of Hyderabad, noted for its cave dwellings and halls dating back to 200 B.C.; temples, **1707.**
**Ajax** (*ā'jăks*), "the Great," in Gk. myth., a hero of Trojan War, **69.**
**Ajax,** "the Lesser," **69.**
**Ajusco** (*ä-ho͝os'kō*) **Mts.,** Mexico, volcanic chain forming part of s. wall of cent. plateau; greatest height, 13,628 ft.; **2218.**
**Akamagaseki** (*ä-kä-mä-gä-sā'kĭ*), Japan. *See in Index* **Shimonoseki.**
**Akbar** (*ăk'bär*) (1542–1605), greatest of Mogul emperors of India, **2286, 1752.**
**Akershus** (*ä'kĕrs-hūs*), Norwegian fortress, **758.**
**Akkra** (*ăk'rà*). Cap. of Gold Coast, W. Africa; r.r. terminus; pop. 20,000.
**Ak'ron,** Ohio, "rubber capital" of world; pop. 208,435; **69, 3072, 676.**
**Akron, Municipal University of.** Non-sectarian, co-ed.; at Akron, Ohio; founded 1870 as Buchtel Col-

lege (name still retained for college of liberal arts) and given to city 1913.

**Alaba'ma,** one of the Gulf states of U. S.; 51,998 sq. mi.; pop. 2,348,174; cap. Montgomery; **70–3,** *map,* **72;** aluminum, **70, 104;** Appalachians in, **158;** chief cities and industries, **426–7, 2274;** coal and iron, **426–7, 70, 72, 3590, 1826;** education, **72–3, 3674, 2435;** foreign trade, **2274;** lumber, **427, 72;** Muscle Shoals, **72, 2512;** origin and meaning of name, **3347, 70;** state flower, **3347.**—*History,* **73;** early settlement, **2274;** Creek War, **1772, 1856;** in Civil War, **857, 1225, 2274.**

**Alabama, University of,** co-ed., state control; arts and sciences, engineering, law, and education at Tuscaloosa; medicine at Mobile; opened 1831; **73,** *picture,* **71.**

**'Alabama' Claims, 73;** Charles F. Adams' part, **12;** Gladstone, **1468;** Grant, **1499;** Sir John Macdonald, **2096;** Russell, **3084.**

**Alabama River,** in Ala., 350 mi. long; navigable to Montgomery; **72.**

**Al'abaster, 1554.**

**'Aladdin** (*ä-lăd'in*) **and the Wonderful Lamp',** story, **169–72.**

**Alame'da,** Calif., residential and mfg. city 6 mi. across bay from San Francisco; pop. 28,806; airplanes, ships, motors; petroleum and borax-refining plants; **3124.**

**Alamo** (*ä'lä-mō*), fortified Franciscan mission in San Antonio, Tex., **3478,** *picture,* **3473.**

**Aland** (*ō'länd*) **Islands,** archipelago at entrance to Gulf of Bothnia; ceded to Russia by Sweden (1809); awarded by League of Nations to Finland (1921) against Sweden's protests; **1248.**

**Alarcón** (*ä-lär-kōn'*), **Pedro Antonio de** (1833–91), Span. novelist, **3308.**

**Alarcón y Mendoza** (*ä-lär-kōn' ē män-dō'thä*), **Juan Ruiz de** (1581?–1639). Span. dramatist, b. Mexico; ('Truth Suspected,' adapted by Corneille as 'Le Menteur'; 'The Weaver of Segovia').

**Alaric** (*ăl'ä-rĭk*) (370?–440), king of Visigoths, **73;** sacks Rome (410 A.D.), **3057;** demands ransom of pepper, **2723.**

**Alas'ka,** a territory of U. S.; 590,000 sq. mi.; pop. 54,899; cap. Juneau; **74–9,** *maps,* **75, 2514–5;** Bering Sea, **384;** caribou, **644;** dogs, **1020,** *picture,* **2896;** fisheries, **74, 1280, 3113;** government, **79, 3601;** history, **74, 79, 1898, 223;** minerals, **74, 76, 3836, 3504;** mosquitoes, **2338;** Mt. McKinley, **77, 2103;** natives, **77–8, 1767, 1174–7;** physical features and climate, **76–7;** products and resources, **74–6;** reindeer, **78, 2993;** seal fisheries, **3167–8;** Yukon R., **3835–6.**

**Alaska sable,** or skunk fur, **3246.**

**Alaskan blackfish, 2365.**

**Alaskan brown bear, 355.**

**Alaska - Yukon - Pacific Exposition.** Held June 1 to Oct. 16, 1909, at Seattle, Wash., to display resources of Alaska and the neighboring regions; $10,000,000 expended; attended by 3,740,600 persons.

**Alas'tor.** In Shelley's poem 'Alastor', the spirit of solitude.

**Alaudidae** (*ä-lą-dĭ'dē*), the lark family, **412;** *picture,* **420.**

**Albacore** (*ăl'bä-kōr*), a fish of the mackerel family, **3553.**

**Al'ba Lon'ga,** Italy, city of anc. Latium, founded, according to tradition, by Ascanius, son of Aeneas; birthplace of Romulus and Remus; **3058, 3041.**

**Albania** (*ăl-bā'nĭ-ȧ*), country in w. Balkans, little larger than Vermont; pop. 850,000; **79, 310,** *maps,* **308, 1196–7;** costume, **897;** people, **307, 1528;** in World War, **3807.**

**Al'bany,** Ga. City on Flint R. in s.w.; pop. 11,555; lumber, cotton, bricks, fertilizers, etc.; municipally owned abattoir.

**Albany,** N. Y., cap. and 2d oldest city of state; pop. 113,344; **80;** capitol, *picture,* **2482;** first wall paper factory, **3667;** golf played in 1659, **1486;** history, **80, 2484, 2486;** Hudson R., **1692.**

**Albany Congress,** convention of Amer. colonists (1754), **80, 3592.**

**Albany Regency,** group of Democratic "bosses" who controlled New York state (1820–54); Van Buren a leader, **3616.**

**Albany River,** in Ontario, flows e. 400 mi. into James Bay, *map,* **616.**

**Al'batross,** the largest of sea birds, **80–1, 408.**

**Albay** (*äl-bī'*), P.I. Port of Luzon on s.e. coast on Bay of Albay; pop. 50,000.

**Albemarle** (*ăl'bĕ-märl*) **Sound,** shallow inlet 60 mi. long indenting coast of N. C., **2518, 1045.**

**Albert I,** king of the Belgians (born 1875), **81, 376.**

**Albert** (1819–61), prince of Saxe-Coburg-Gotha, consort of Queen Victoria of England, **3639, 454, 3539;** memorial, *picture,* **2050.**

**Albert** (*ăl-bĕr'*), France, town in extreme n., 18 mi. n.e. of Amiens; in World War, **3794, 3806.**

**Alber'ta,** province in w. Canada; nearly as large as Tex.; pop. 600,000; cap. Edmonton; **82–3, 602,** *map,* **602–3;** Athabaska R., **82, 2102;** Canadian Pacific Ry., **608;** chief cities and industries, **575, 1084;** irrigation, **1830;** Peace River district, **2698–9, 83;** Rocky Mts. in, *pictures,* **82, 600, 602, 603.**

**Alberta, University of.** At Edmonton, Alberta; co-ed., non-sectarian; supported by province; opened 1908 (established 1906); arts and sciences, applied science, architecture, law, agriculture, pharmacy, household economics. Alberta College (Meth.) and Robertson College (Presb.) are affiliated.

**Alberta Institute of Technology and Manual Arts.** At Calgary, Alberta; non-sectarian, co-ed.; opened 1916; manual arts, domestic science, vocational training.

**Albert Edward Nyan'za,** lake in e.-cent. Africa, **36, 1068.**

**Albert Lea** (*lē*), Minn. Resort and farming trade center in lake region 100 mi. s. of St. Paul; pop. 8053; Albert Lea College for Women, Luther Academy.

**Albert Memorial,** London, *picture,* **2050.**

**Albert Nyanza,** a lake in e.-cent. Africa, one of chief sources of Nile, **36, 1068.**

**Albigenses** (*ăl-bĭ-jĕn'sēz*), heretical sect prominent in early 13th cent., named from Albi, France, their cap.; styled themselves *Cathari* ("the pure"); crusade against, **2762.**

**Albi'no,** a person or animal whose skin, hair, and eyes lack coloring matter; birds, **411;** cats, **658;** elephants, **1127;** ferrets, **1234;** rabbits, **1585.**

**Albion** (*ăl'bĭ-ȯn*). Anc. name of Britain; literally, "white land," with reference to chalk cliffs of s. coast.

**Albion,** Mich. City on Kalamazoo R., 35 mi. s. of Lansing; pop. 8354; Albion College; iron-working industries.

**Albion College.** At Albion, Mich.; co-ed., Meth. Episc.; founded 1833, opened 1843; present name and status 1861; liberal arts, music, painting, business.

**Albret, Jeanne d'** (*zhän däl-brā'*), queen of Navarre, **1637.**

**Albula** (*äl'bų-lä*) **Pass,** Switzerland, high pass in Alps, chief route from n. to Upper Engadine; railway, **3417,** *picture,* **3420.**

**Albu'men,** a protein, **83, 714;** chemical structure, **715;** found in eggs and meat, **2926.**

**Albu'min,** any protein resembling albumen in properties, **83.**

**Albuquerque** (*ăl-bų-kĕr'kā*), **Alfonso d'** (1453–1515), "the Great." Called "The Portuguese Mars"; conqueror of Goa. and founder of Port. power in E. Indies.

**Albuquerque,** N. M., 56 mi. s.w. of Santa Fe, largest city and center of mining, farming, stock raising, and lumber district; pop. 15,157; various mfrs.; state univ.; **2466.**

**Alca'ics.** In poetry, several kinds of verse named for their reputed inventor Alcaeus (Gk. lyric poet, flourished about 600 B.C.).

**Alcala** (*äl-kä-lä'*), old town in Spain near Madrid; pop. 12,000: birthplace of Cervantes; univ. founded, **3824.**

**Alcantara** (*äl-kän'tä-rä*), Spain. Anc. town on Tagus R.; owes name (Arabic "bridge") to Rom. bridge built by Trajan; about 1215 became stronghold of knightly Order of Alcantara, organized for defense against Moors.

**Alcazar** (*äl-kä'zär*), Span. or Moorish palace, originally a fort; at Seville, **3182;** at Toledo, **3300.**

**Alceste** (*äl-sĕst'*). Hero of Molière's 'Misanthrope', a generous kindly nature warped by contact with insincerity.

**Alcestis** (*ăl-sĕs'tĭs*), in Gk. myth., wife of King Admetus, whom she saves by dying in his stead; rescued from Hades, **1640.**

**Alchemy** (*ăl'kĕ-mĭ*), **710, 2777, 3839.**

**Alcibiades** (*ăl-sĭ-bī'ȧ-dēz*) (450–404 B.C.), handsome, brilliant, unscrupulous Athenian statesman and general, nephew of Pericles; pupil of Socrates, **3270,** *picture,* **3271;** precipitates 3d Peloponnesian War, **1524.**

**Alcinoüs** (*ăl-sĭn'ō-ŭs*), in 'Odyssey', king of Phaeacia, **2563–4.**

**Alcmaeonidae** (*ălk-mē-ŏn'ĭ-dē*), a wealthy and powerful family of anc. Athens, claiming descent from Alcmaeon, great-grandson of Nestor, **2729.**

**Alcmene** (*ălk-mē'nē*), the mother of Hercules. **1640.**

**Al'cock, Sir John** (1892–1919), first non-stop transatlantic airplane flight, **63.**

**Al'cohol, 84;** antidote for, **1270;** dissolves resins, **2997;** evaporates rapidly, **1207;** fermentation, **3828, 1232;** freezing point, **1362;** made from potatoes, **2901;** molecular structure, **4040;** used in collodion, **833,** in soap-making, **3267,** in low-temperature thermometers, **3486,** in varnishes, **3619.**

**Alcoholic beverages, 84.** *See also in Index* **Liquor laws.**

**Alcott** (*ąl'kŏt*), **Amos Bronson** (1799–1888), Amer. philosopher and educator (b. Wolcott, Conn.), **84, 856.**

**Alcott, Louisa May** (1832–88), Amer. author, **84–5, 856,** *picture,* **1143.**

**Alcuin** (*ăl'kwĭn*) (735–804), Eng. scholar and churchman, head of Charlemagne's palace school, **689, 690.**

**Alcyone** (*ăl-sī'ō-nē*) or **Halcyone,** in Gk. myth., **1925.**

**Aldabra** (*äl-dä'brȧ*). Group of small isls. in Indian Ocean, part of Brit. colony of Seychelles; 265 mi. n.w. of Madagascar.

**Aldebaran** (*ăl-dĕb'ȧ-rȧn*), a prominent fixed star, **3342;** location in sky, *pictures,* **873, 3343;** spectrum, *picture,* **3313.**

**Alden** (*ąl'dĕn*), **John** (1599–1687), *Mayflower* Pilgrim; in Longfellow's 'Courtship of Miles Standish', undertakes to court Priscilla Mullins for Standish and is bidden to "speak for yourself, John," **3338, 2057.**

**Alder** (*ąl'dĕr*), a genus of shrubs or trees, of the family *Betulaceae,* **85;** catkins, **3534;** classified, **3533.**

**Alder fly,** species of large, net-veined insect peculiar to Amer.;

larvae (dobsons) used as bait for still-fishing; eggs laid on leaves or branches overhanging water, in which young live until maturity; eggs, *picture*, **1091.**
**Alderney** (*ąl'dēr-nĭ*), one of Channel Isls.; pop. 2600; 3 sq. mi.; **687.**
**Aldershot** (*ąl'dēr-shŏt*), England. Town and army camp in Hampshire, 34 mi. s.w. of London; pop. 40,000.
**Aldine** (*ăl'dīn*) **Press.** *See in Index* **Manutius.**
**Aldington, Richard** (born 1892). Brit. poet; leader of "imagist" school ('Images Old and New'; 'Images of Desire').
**Aldrich** (*ąl'drĭch*), **Nelson W.** (1841–1915). U. S. Senator from R. I. (1881–1911); b. Foster, R. I.; authority on tariff and finance; Payne-Aldrich Tariff, Aldrich-Vreeland Currency Law.
**Aldrich, Thomas Bailey** (1836–1907), Amer. poet and novelist; b. Portsmouth, N.H. ('Story of a Bad Boy'; 'Marjorie Daw', etc.); **470.**
**Aldus Manutius** (*ąl'dŭs mą-nū'shĭ-ŭs*) (1450–1515), famous Venetian printer, **456, 2936.**
**Ale, 84.**
**Alecto** (*ą-lĕk'tō*), in Gk. myth., one of Furies, **1382.**
**Ale gallon, 3715.**
**Alemanni** (*ăl-ą-măn'ī*) ("all-men"), confederacy of Ger. tribes, **1194;** conquered 495 by Clovis; term Allemagne applied by French to modern Germany.
**Alembert** (*ą-läń-bĕr'*), **Jean le Rond d'** (1717–83). Fr. mathematician and philosopher, associated with Diderot on the 'Encyclopedia'.
**Alemtejo** (*ą-läń-tą'zhō*), province of s. Portugal, famous for cork industry, **2888.**
**Alençon** (*ą-läń-sôń'*), France, 115 mi. s.w. of Paris; pop. 18,000; linen and woolen goods; lace manufactures ("point d' Alençon"), **1950, 1348.**
**Alep'po** (Arabic *Haleb*), metropolis of n. Syria; pop. 250,000; for centuries center of caravan trade between Bagdad and Damascus; **3426, 1042;** Allenby captures, **3807;** street scene, *picture*, **3425.**
**Alessandria** (*ą-lĕs-sän'drē-ą*), **Italy.** Fortified city in Piedmont, 47 mi. n. of Genoa; pop. 78,000; r.r. center; textiles, clothing.
**Aletschhorn** (*ą'lĕch-hôrn*), a peak (13,773 ft.) in the Swiss Alps, **3413;** the Aletsch glacier, 16 mi. long, is the greatest in the Alps.
**Aleutian** (*ą-lū'shăn*) **Islands,** chain of small isls. extending 1200 mi. w. from Alaska, **76, 2619,** *maps,* **79, 2514–5;** bound Bering Sea, **384;** route of prehistoric migration, **2514;** fur seals, **3167;** in U. S. coast defense system, **2625.**
**Aleuts,** natives of Aleutian Isls. and n. side of Alaskan peninsula, **79;** allied to Eskimos, **1174;** reindeer herds, **78, 2993.**
**Al'evin,** a young fish, **3113.**
**Alewife,** or gaspereau, a shad-like fish found chiefly in Chesapeake Bay, New England, and e. Canada; average length 8 to 10 in.; **1645.**
**Alexander** (1893–1920), king of Greece; succeeded 1917; **1526, 3625, 3626.**
**Alexander III** (born 1888) (Kara-Georgevitch), king of Jugo-Slavia, **3177.**
**Alexander,** popes. For complete list *see in Index* **Pope.**
**Alexander VI** (1431–1503), pope, **467;** and Savonarola, **3131.**
**Alexander I** (1777–1825), czar of Russia, **85, 3090;** Peace of Tilsit, **2396, 871;** Holy Alliance, **1196.**
**Alexander II** (1818–81), czar of Russia, **85, 3090–1.**
**Alexander III** (1845–94), czar of Russia, **85, 3091–2;** marriage, **757.**
**Alexander I** (Obrenovitch) (1876–1903), king of Serbia; succeeded 1889; assassinated by Kara-Georgevitch supporters, **3177.**
**Alexander, John W.** (born 1856), Amer. portrait painter and mural decorator, b. Allegheny, Pa. ('The Pot of Basil'; 'The Evolution of the Book', in Congressional Library, Washington); **2634, 1591.**
**Alexander of Battenberg** (1857–93). First prince of Bulgaria; elected by Bulgarians to newly created throne in 1879; abdicated in 1886.
**Alexander the Great** (456–323 B.C.), king of Macedon, and one of history's greatest conquerors, **85–7;** anecdotes, **1011–2, 1371;** Aristotle instructs, **196;** captures Tyre, **2774;** carries first silk to Europe, **3235;** conquers Egypt, **86, 1106–7,** Persia, **86–7, 2738;** and family of Darius III, *pictures,* **2641, 2737;** Hellenizes the East, **1525;** influence on India, **1752.**
**Alexander Severus** (*sĕ-vē'rŭs*) (208?–235). Rom. emperor; succeeded his cousin Heliogabalus in 222; able, public-spirited, but too indulgent; murdered in insurrection.
**Alexander Archipelago,** group of more than 1100 isls. along coast of s. Alaska, *maps,* **75, 2514–5.**
**Alexan'dra** (born 1844), queen of Edward VII of England, **1089, 757.**
**Alexandra Feodorovna** (1872–1918), czarina of Russia; born Princess Alix of Hesse, granddaughter of Queen Victoria; **2506.**
**Alexandria,** chief seaport of Egypt; pop. 445,000; center of late Gk. culture; **87–8, 1096, 1107;** center for Christian study, **390, 88;** cigarettes, **1097;** founded by Alexander the Great, **86;** library, **88,** *picture,* **1992;** Pharos, **3178, 2004,** *picture,* **3179.**
**Alexandria,** La. City, parish seat, near center of state on Red R.; pop. 17,510; in yellow pine and farming region; lumber, iron products, cottonseed-oil, etc.; old Fr. and Span. trading post.
**Alexandria,** Va., mfg. and shipping town on Potomac R. 6 mi. s. of Washington; pop. 18,060; church where Washington worshiped and school where he taught; **3686.**
**Alexandrian Age, 1538, 88.**
**Alexandropol** (*ăl-ĕgz-ăn-drō'pŏl*). Military town in Armenia 85 mi. s.w. of Tiflis; pop. 50,000; silk mfrs.; Russians routed Turks 1853.
**Alexandrovsk** (*ą-lĕgz-ăn'drŏfsk*), Russia, port and naval station in n. on Catherine Harbor, Murman Coast, **3094;** also fortified town of s. Russia on Dnieper R., 50 mi. s. of Ekaterinoslaf; pop. 52,000.
**Alex'is** or **Alexei** (1691–1718), Russian czarevitch, son of Peter the Great, **2747.**
**Alexius** (*ą-lĕk'sĭ-ŭs*) **I, Comnenus** (1048–1118), Byzantine emperor, succeeded 1081; brilliant soldier, efficient administrator; appeals for aid against Turks, **929.**
**Alfal'fa,** or lucerne, **88–9, 2511, 1609, 3240;** Ariz., **202, 1830;** Calif., **89, 578, 581, 1830;** Colo., **89;** Idaho, **1725, 1726;** Kan., **1909;** Miss., *picture,* **2263;** N. M., **2465;** Neb., **2430, 2432;** Tenn., **3468;** Wyo., **3820.**
**Alfieri** (*ăl-fē-ā'rē*), **Count Vittorio** (1749–1803), Ital. tragic poet; chief works, **1038, 1833.**
**Alföld** (*ąl-fĕld*), large fertile plain of cent. Hungary, **1702, 961.**
**Alfon'so I** (1094–1185). Founder of Port. kingdom; proclaimed king after victory of Ouriques (1139) over Moors.
**Alfonso VI** (1643–67), king of Portugal, **90.**
**Alfonso XII** (1857–85), king of Spain, **90.**
**Alfonso XIII** (born 1886), king of Spain, **90.**
**Alfred the Great,** king of England (848–99), **90–1, 1152;** literary work, **90, 1163;** rebuilds London, **2056;** son, **1087.**
**Alfred University.** At Alfred, N. Y.; co-ed., founded 1836; arts and sciences, ceramics, agriculture.
**Algae** (*ăl'ĵē*), a low type of plants, including seaweeds, **90–2, 2822, 2831, 3937;** combine with fungi to form lichens, **1994, 2680, 3938;** constitute plankton, **2558, 396;** in geysers, **1456;** in Mammoth Hot Springs, **3830;** on sloth, **3252;** seaweed forms, **3170–1.**
**Algaroba** (*ăl-ĝą-rō'bą*), a species of locust, **1603.**
**Algarve** (*ăl-ĝär-vă'*), province of s. Portugal, **2889.**
**Algebra** (*ăl'ĵē-brą*), a branch of mathematics, **92–6, 2278, 2174.**
**Algeciras** (*ăl-ĵē-sē'rąs*), seaport of s. Spain; pop. 16,000; **3299;** conference, **2327, 1458.**
**Alger** (*ăl'ĵēr*). **Horatio** (1834–99). Author of boys' books, b. Revere, Mass. ('Luck and Pluck'; 'Ragged Dick' series).
**Alger, Russell A.** (1836–1907). Business man and politician, b. Lafayette, Ohio; gov. of Mich. 1885–86; U. S. sec. of war 1897–99.
**Alge'ria,** Fr. possession in n. Africa, 223,000 sq. mi.; pop. 5,500,000; **96–7, 1344,** *maps,* **97, 40–1;** Decatur's expedition, **971;** desert scene, *picture,* **3122.**
**Algiers** (*ăl-ĵērz'*), fortified seaport, cap. of Algeria; pop. 172,000; coaling station; extensive trade; **97.**
**Algol** (*ăl'ĝŏl*), a variable star, **3343;** *charts,* **873, 3343.**
**Algonkian** (*ăl-ĝŏn'kĭ-ăn*) **period,** division of geologic time, **1418, 1419.**
**Algonquian** or **Algonkian stock,** group of N. Amer. Indians whose tribes ranged from Labrador to Rocky Mts. and s. to Pamlico Sound and Cumberland R.. **1765–6, 3868;** hostile to English, **1772;** Illini confederacy, **1736;** legends used by Longfellow, **2057.**
**Algon'quin Park,** Ontario, 175 mi. w. of Ottawa; covers 1,800,000 acres; abounds in game and fish; **2400.**
**Algonquins,** a tribe of the Algonquian stock formerly living in Ontario; Champlain aids, **687.**
**Alhambra** (*ăl-hăm'brą*), **97, 3302,** *picture,* **3298.**
**Ali** (*ä'lē*) (600?–661). Fourth Mohammedan calif; married Mohammed's daughter Fatima, founding Fatimite line.
**Ali Baba** (*bä'bä*). Hero of an 'Arabian Nights' tale; obtains wealth of the "Forty Thieves" by learning magic password "Open sesame."
**Alibi** (*ăl'ĭ-bī*) (Latin, "elsewhere"). A form of defense in criminal cases by which the accused undertakes to show that he was elsewhere when the crime was committed.
**Alicante** (*ą-lē-kän'tā*). Seaport of w. Spain; pop. 58,000; exports wine, fruit, oil.
**'Alice's Adventures in Wonderland',** story, **647–50.**
**A'lien and Sedition Acts, 14, 3347, 2107.**
**Aliens,** political status in U.S., **768;** naturalization, **2405.**
**Alimen'tary canal,** the system of connected internal organs by which higher animals assimilate food; conducts digestion, **1010–1, 2793–5;** in earthworms, **1066;** most primitive form found in roundworms, **3945;** structure in human body, *diagram,* **2794.**
**Aliz'arine,** dye-base of "lake" colors, obtained from coal-tar, **814.**
**Al'kali,** a compound of hydrogen and oxygen in equal parts with an "alkali metal" (potassium, sodium, caesium, rubidium, or lithium) or with ammonium, **8, 10;** antidote for, **1270;** caustic potash, **2899;** caustic soda, **3272;** effect on soil, **966;** obtained from kelp, **3171;** turns litmus blue, **2030–1, 10;** used

in mercerizing, **2198,** in soap-making, **3263, 3267,** in storage batteries, **3362.**

**Alkali flats,** in New Mexico, **2464.**

**Alkaline earth metals,** those forming compounds resembling alkalies, **10.**

**Alkali soils, 3273, 966, 1554, 2444, 3086.**

**Al'kaloids,** poisonous vegetable compounds with alkaline properties, **10;** in cocoa, **756,** coffee, **823,** tea, **3450;** strychnine, **3372.**

**Alkmaar** (*älk'mär*), Netherlands, town on N. Holland Canal 20 mi. n. w. of Amsterdam; pop. 24,000; unsuccessfully besieged by Spaniards in 1573; cheese trade, **2441.**

**Allah** (*ăl'à*), Arabic name used by Mohammedans for God, **2276, 1942.**

**Allahabad** (*ä-lä-hä-bäd'*), India ("City of God"), at junction of Ganges and Jumna rivers; cap. of United Provinces; pop. 172,000; pilgrimage center for Hindus; trade in cotton, grain, sugar; **1745.**

**Al'lah ak'bar** ("Allah is great"). War cry of the Mohammedans.

**Allan, Sir Hugh** (1810–82). Canadian ship builder; organized (1853) Allan line of steamships, and one of original promoters of Canadian Pacific Ry.

**Allan, Maud** (born 1879). Classical dancer, b. Toronto, Canada.

**Al'lan-a-Dale',** friend of Robin Hood, **3029.**

**Allegheny** (*ăl'ĕ-gān-ĭ*) **College.** At Meadville, Pa.; co-ed., Meth. Episc.; founded 1815; arts and sciences.

**Allegheny** or **Alleghany Mts.,** part of Appalachian system, **158;** in Md., **2160;** Plateau in Pa., **2718;** in W. Va., **3720.**

**Allegheny River,** rises in Potter County, n.-cent. Pa.; drains n.w. quarter of Pa. and s. N. Y.; **2573, 2812.**

**Al'legory,** a presentation of abstract thoughts or principles by means of stories, either in words or in pictures; parables and fables are forms of allegory; examples, Cupid and Psyche, **939–40;** Dante's 'Divine Comedy', **958–61,** 'Pilgrim's Progress', **535–8, 1165.**

**Alle'gri, Antonio,** known as Correggio, **2630.**

**Allen, Ethan** (1737–89), Amer. Rev. leader, **98, 3630, 219.**

**Allen, (Charles) Grant (B.)** (1848–99). Canadian novelist and popular writer on scientific subjects ('Physiological Aesthetics'; 'The Evolutionist at Large'; 'The Woman Who Did').

**Allen, James Lane** (born 1849). Amer. novelist, b. near Lexington, Ky. ('A Kentucky Cardinal'; 'The Choir Invisible', etc.; chiefly Kentucky life).

**Allen, William** (1532–94), Eng. cardinal; established (1568) college at Douai, France, for Eng. Rom. Cath. exiles; Bible translation, **389.**

**Al'lenby, Edmund H. H.,** first **Viscount** (born 1861), Brit. field marshal, commander of Palestine expedition in World War; appointed high commissioner of Egypt in 1919; **3807, 3798, 2643, 932.**

**Allenstein** (*ä'lĕn-shtīn*), town in former e. Prussia on Alle R. 30 mi. n. of Polish boundary; pop. 33,000; chief city of Mazurian Lakes region, scene of Hindenburg's operations 1914–15; plebiscite, **2856.**

**Allentown,** Pa., industrial city on Lehigh R., 50 mi. n.w. of Philadelphia; pop. 73,502; cement, silk, furniture, motor trucks; Muhlenburg College (Luth.), Allentown College for Women; **2721.**

**All Fools'** or **April Fools' Day, 162, 1673.**

**Al'lia.** Small r. in anc. Italy; joins Tiber 12 mi. above Rome; here Gauls under Brennus defeated Romans 390 B.C.

**Alli'ance,** Ohio. Industrial and r.r. center 56 mi. s.e. of Cleveland on Mahoning R.; pop. 21,603; large engraving works; cash registers, iron and steel products; Mt. Union College.

**Allies',** in World War, **3789.**

**Al'ligator, 98,** *picture,* **2925;** classified among reptiles, **2997;** distinguished from crocodiles, **923;** bred for hides, **1298.**

**Alligator pear,** fruit of a West Indian tree, **1378.**

**Al'lison, William Boyd** (1829–1908), Amer. political leader, authority on finance, b. Perry, Ohio; U. S. senator from Iowa 1873–1903; Bland-Allison Act, **1610.**

**Allitera'tion, 1239.**

**Al'lium,** the onion genus, **2581.**

**Al'lopath,** defined, **2193.**

**Al'losaurs,** prehistoric reptiles, **132, 134,** *picture,* **133.**

**Allot'ropy,** a change in physical properties without accompanying chemical change; seen in carbon, **935,** oxygen, **2612,** phosphorus, **2777,** sulphur, **3389.**

**Allouez** (*à-lụ-ā'*), **Claude** (1620–90), Fr. Jesuit in Amer.; explored L. Superior region and parts of Mississippi Valley; many years at Kaskaskia, Ill.; in Wisconsin, **3772.**

**Alloys', 99;** antifriction types, **1370, 150, 3504;** babbitt metal, **99, 3504;** brass, **99, 3839;** bronze, **515;** coins, **1481, 2506;** German silver, **2507, 99;** invar, **2507, 3398;** low-melting-point types, **428;** shot metal, **220;** type metal, **99, 3572.** *See also* under names of metals.

**All Saints' Day, 1566.**

**All Souls' College,** Oxford, **2610.**

**All Souls' Day.** Nov. 2, day set aside in Rom. Cath. church for prayer and almsgiving in behalf of the faithful departed.

**Allspice** or **pimento, 3317, 3318, 1859,** *picture,* **3319;** belongs to myrtle family, **2724;** leaves furnish "Trinidad tea," **3451.**

**Allston** (*ạl'stŏn*), **Washington** (1779–1843). Amer. historical and portrait painter, b. Waccamaw, S. C. ('Belshazzar's Feast'; portrait of Benjamin West).

**'All's Well That Ends Well',** a comedy by Shakespeare (about 1602); plot based on story in Boccaccio's 'Decameron'.

**Allu'vial soil, 3273, 2791;** deposits by Ganges R., **1393,** Hwang, **1706,** Indus, **1778,** Mississippi, **2266,** Nile, **1092, 2510,** Po, **2848.**

**Al'ma,** small r. of the Crimea; near its mouth in Black Sea, British, French, and Turks defeated Russians (1854), **922.**

**Alma,** Mich. City 38 mi. w. of Saginaw on Pine R.; pop. 7600; Michigan Masonic home; auto trucks, gas engines, furnaces.

**Alma College.** At Alma, Mich.; co-ed., Presb.; founded 1886; arts and sciences, pedagogy, commerce, music, art.

**Almaden** (*ăl-mä-thĕn'*), Spain, town 65 mi. n. of Cordova; pop. 7000; mercury mines, **2200.**

**'Almagest'** (*ăl'mà-jĕst*), book on astronomy by Ptolemy, **2931.**

**Almagro** (*ăl-mä'grō*), **Diego de** (1475–1538), Spanish adventurer, **2814.**

**Al'manac,** a book or pamphlet containing a calendar and astronomical data, usually also lists of holidays, important recent events, and other miscellaneous information; nautical, **2551;** Poor Richard's, **111, 1357.**

**Alma-Tadema** (*ăl'mà-tăd'ĕ-mà*), **Sir Lawrence** (1836–1912), Eng. painter, b. in Netherlands; portrayed Gk. and Rom. life; **2632;** paintings by, *pictures,* **1534, 3542.**

**Almeida** (*äl-mā'ē-dä*), **Antonio José de** (born 1866). President of Portugal, elected 1919.

**Almeria** (*äl-mā-rē'ä*), Spain. Seaport 60 mi. s.e. of Granada, cap. of province of same name; pop. 48,000, founded by Phoenicians, became flourishing port and pirate headquarters under Moors; exports fruit.

**Almond** (*ä'mond*), a tree of the rose family, **99,** *pictures,* **1226, 2545;** a "polypetalous" tree, **3533;** in U. S., **582, 2444.**

**Al'monry,** a place where alms are given, **2300.**

**Aloe** (*ăl'ō*), **American,** or century plant, a species of agave, **42, 2855.**

**Aloe, black,** an Amer. species of the sloe or blackthorn, **3251.**

**Alost** (*ä'lōst*). Historic town in Belgium, midway between Brussels and Ghent; pop. 36,000; anc. cap. of Flanders; contained one of first printing presses in Europe; captured by Germans 1914.

**Alpaca** (*ăl-păk'à*), a S. Amer. animal of the camel family, **100, 591, 450;** cloth, **804, 3782.**

**Alp-Arslan** (*ălp-är-slän'*) (1029–72). Seljuk sultan (1063–72); conquered large part of Asia.

**Alpe'na,** Mich. City on Thunder Bay, L. Huron; pop. 11,101; paper, lumber, cement, fish hatchery.

**Al'pha and Ome'ga.** First and last letters of Gk. alphabet; hence, "the beginning and the end."

**Al'phabet, 100–1, 3816–7;** Braille, for blind, **436;** Cadmus myth, **563;** Cyrillic, **388, 3096, 1901, 3177;** finger, **970;** Gothic, **1435, 1436;** Hebrew, **1624–5;** invented by Phoenicians, **2774;** Japanese, **1871.** *See also in Index* entries on individual letters.

**Alpha Centau'ri,** nearest fixed star, **240, 241, 3340, 3342.**

**Alpha Crucis,** star, **3342.**

**Alpha rays,** of radium, **2960.**

**Alpheus** (*ăl-fē'ŭs*), r. of Peloponnesus; in myth., **1640.**

**Alphonso.** *See in Index* **Alfonso.**

**Alpine,** Tex., **3478.**

**Alpine hare,** *picture,* **1584.**

**Alpine marmot, 2912.**

**Alpine race, 2956, 3250.**

**Alpine rose, 3066.**

**Alps,** the greatest mountain system of Europe, **101–2, 1190,** *pictures,* **1189, 1193, 1835, 1841, 3412–21;** chamois, **686;** glaciers, **1465–6, 3417–21;** Hannibal crosses, **1575,** *picture,* **1577;** in Italy, **1835;** marine fossils, **1334;** St. Bernard dogs, **1018;** in Switzerland, **3413–4, 3417–21;** tunnels, **3552;** Tyrol, **3573–4.**

**Alsace-Lorraine** (*ăl-sās-lŏ-rān'*), region in n.e. France taken by Germany 1871, restored to France 1919 after World War; 5605 sq. mi.; pop. 1,875,000; **102–3,** *map,* **1351;** iron, **1820, 1826, 1348;** potash, **103, 2900.** —*History:* Charles the Bold invades, **697;** Alsace won by France (1648), **3018, 3489;** in Franco-Prussian War, **1356;** restored to France (1919), **3808;** story, 'How the Tricolor Came Back to Metz', **103–4.**

**Alsatia** (*ăl-sā'shĭ-à*). Latin name for Alsace; also, popular name for Whitefriars, London, once a refuge for criminals; described in Scott's 'Fortunes of Nigel'.

**Alster River,** Germany, **1567.**

**Altai** (*ăl'tī*) **Mts.,** in Mongolia and s. Siberia; highest point Byelukha (14,800 ft.); rich in minerals; **739,** *map,* **740.**

**Altair',** star, **3342.**

**Altamira** (*äl-tà-mē'rà*), **Cave of,** prehistoric paintings, **2627, 662,** *picture,* **2628.**

**Alt'dorf,** Switzerland, cap. of canton of Uri, on L. Lucerne; scene of story of William Tell, **3463.**

**Altenburg** (*ăl'tĕn-bụrg*), Germany. Mfg. town 24 mi. s. of Leipzig; pop. 40,000; grain and cattle trade; old castle celebrated as scene of abduction (1455) of Saxon princes Albert and Ernest.

**Alternating currents,** electric, **1114, 1052, 1125;** rectified by audion, **257,** by rotary transformer, **3524;** used in street railway systems, **3371.**
**Alterna'tion of generations,** type of reproduction in which a sexual generation alternates with a generation which reproduces without sexual coöperation, **3173, 3937;** seen in liverwort, **2032;** moss, **2338–9.**
**Al'ternator,** a type of dynamo, **1052.**
**Altgeld** (*ält'gĕld*), **John P.** (1847–1902). Gov. of Ill. 1893–97; b. in Germany; pardoned Haymarket anarchists; advocated prison reform.
**Altim'eter,** of airplane, **66.**
**Al'titude,** affects climate and plant life, **794, 226, 1078–9, 2210, 3285;** heights attained by airplanes, **60, 62,** by balloons, **312,** *pictures,* **51;** heights at which various animals live, **397;** shown by barometer, **332–3.**
**Altkirch.** Alsatian village 18 mi. e. of Belfort; in World War changed hands several times during border fighting of Aug. 1914, remaining as most advanced town in Ger. lines thereafter; pop. 3500.
**Altmuhl** (*ält'mül*) **River,** in cent. Bavaria, **961.**
**Al'ton,** Ill. Mfg. and r.r. center 20 mi. n. of St. Louis, on Mississippi R.; pop. 24,682; glass, cartridges, machinery, plows; Elijah Lovejoy, abolitionist, killed in 1837.
**Al'tona,** Germany, seaport w. of and adjoining Hamburg, of which it is commercially and industrially a part; pop. 169,000; **1568.**
**Altoo'na,** Pa., 86 mi. e. of Pittsburgh near famous Horseshoe Bend; pop. 60,331; immense r.r. shops; founded 1850 by Pennsylvania R. R.; **2721.**
**Alto-relievo** (*äl-tō-rā-lyā'vō*), or "high relief," in sculpture, **3154.**
**Al'truists** (from Latin *alter,* "other"), in philosophy, **2772.**
**Al'um, 104, 3390;** in baking powder, **305.**
**Alu'mina,** aluminum oxide, found in clay, **784;** as corundum, **1142;** rubies and sapphires, **1409;** used in cement, **674.**
**Alu'minum** or **alumin'ium,** a very light metallic element, **104–5;** abundant in nature, **711,** *picture,* **1058;** alloys, **104, 314, 3548, 515;** deposits in U. S., **70, 207, 1432;** nitric acid does not dissolve, **2510;** oxide, **1142, 1409;** refined by electrolysis, **1125;** silicates, **1230, 2219;** sulphate (in alum), **104;** used in glass-making, **1472,** in making rubies, *pictures,* **1410, 1411.**
**Aluminum bronze, 515.**
**Al'unite** or **alum-stone, 104.**
**Alva** (*äl'vä*) or **Alba, Duke of** (1508–83), Span. general; set up "Council of Blood" in Netherlands; **2442, 3741, 520.**
**Alva, Cape,** westernmost point of U.S., **3580.**
**Alvarado** (*äl-vä-rä'thō*), **Pedro de** (1485–1541), Span. cavalier, companion of Cortez in conquest of Mexico; names Salvador, **3119.**
**Alve'oli,** of lungs, *picture,* **2083.**
**Alverstone, Richard Webster,** first **Baron** (1842–1915). Lord Chief Justice of England 1900–15; Brit. representative on Bering Sea and Alaska Boundary Commissions.
**Alys'sum, sweet,** a flowering plant, **554.**
**A.M.,** "ante meridiem," **3501.**
**A'ma,** a curassow-like bird of the Amazon valley, *picture,* **401.**
**Amadeus I** (*ăm-à-dē'ŭs*) (1845–90). King of Spain, son of Victor Emmanuel II of Italy; accepted crown from revolutionists 1870; abdicated in 1873.
**Amadis** (*ăm'à-dĭs*) **of Gaul,** hero of famous medieval prose romance, **3039, 683.**
**Amager** (*à'mä-ġĕr*) **Island,** Denmark, **880.**
**Amalekites** (*ăm-à-lĕk'ītz*), an anc. tribe of Edomites, hereditary foes of the Israelites; crushed by Saul and David; **591.**
**Amal'fi.** Seaport of Italy, 22 mi. s.e. of Naples; pop. 7000; 13th cent. cathedral and old Capuchin monastery; in Middle Ages rivaled Genoa and Pisa.
**Amal'gam,** a mixture of mercury with another metal, **2200, 99;** with gold, **1480,** tin, **3504.**
**Amani'ta,** a genus of poisonous fungi, **2375,** *pictures,* **1382, 2374.**
**Amapal'a,** Honduras, country's only Pacific port; pop. 4000; **1676.**
**Ama'ra,** Mesopotamia, town about 150 mi. n. of Persian Gulf, *picture,* **2200.**
**Am'aranth,** flowering plant of the genus *Amarantus,* such as love-lies-bleeding and Joseph's coat, **3940.**
**Amargosa** (*ä-mär'ġō-sà*) **River,** Calif., **970.**
**Amaril'lo,** Tex., r.r. and cattle-shipping city in Panhandle about 60 mi. from w. border; pop. 15,494; **3478.**
**Amar'na letters, 1106.**
**Amaryl'lis family** of plants, allied to the lily and iris families, and including amaryllis, narcissus, and agave, **3940.**
**Amati** (*à-mä'tē*), celebrated Ital. family of violin-makers at Cremona, of whom the most famous was Nicolo (1596–1684), **3646.**
**Am'azon River,** in S. Amer., world's largest r. (4000 mi. long), **105–6, 493, 494, 3284,** *maps,* **105, 494;** Brazil nuts, **2545–6;** Indians, **1413;** jungle, *picture,* **3285;** origin of name, **106;** rubber, **3284, 3072;** tributaries, **105, 494, 836;** tidal wave, **3497;** giant water-lily, **3699.**
**Amazons,** in Gk. myth., a nation of female warriors, **106;** Hippolyta, **1640;** and Theseus, **3487.**
**Ambala** (*ăm-bä'lä*) or **Umballa.** City and military station of Brit. India in Punjab 3 mi. e. of Ghaggar R.; pop. 80,000.
**Ambas'sadors, 1012–3;** how appointed in U. S., **3594;** of the Pope, **2666.**
**Amber,** a fossilized resin, **106;** bakelite a substitute, **816;** mythical origin, **2759;** used in varnish, **2643.**
**Am'bergris, 2728, 3726.**
**Amber'no River,** New Guinea, **2453.**
**'Ambition',** a Little Talk by Arthur Mee, **107–8;** frontispiece, Vol. I.
**Amboy'na** or **Amboina,** chief city and comm. center of Molucca Isls., Dutch East Indies, on Amboyna Isl. in n. of Banda Sea; pop. 8000; cloves, **810.**
**Ambridge,** Pa. Iron-mfg. borough 16 mi. n.w. of Pittsburgh on Ohio R.; pop. 12,730.
**Ambrose** (*ăm'brōz*), **Saint** (340?–397), bishop of Milan, **764, 2235.** Among first hymn writers; won earliest great victory of church over temporal power, compelling Theodosius the Great to do public penance for Thessalonica massacre.
**Ambro'sia.** In anc. myth., the food or drink of the gods, giving immortality; name later applied only to food, and drink of the gods was called nectar.
**Amelia Sedley,** in Thackeray's 'Vanity Fair', type of sweet, clinging, rather cloying wife; Thackeray's comment, **3479.**
**Amen** (*ā-mĕn'*). Hebrew word also used by Christians to conclude prayers and hymns, where it has the sense "so be it."
**Amenho'tep III,** king of Egypt 1411–1375 B.C.; great warrior and builder; **1655;** statues of, **2196,** *picture,* **1105.**
**Ameno'phis** or **Amenhotep II,** Egypt. king of 18th dynasty, reigned 26 yrs. in 15th cent. B.C.; grandfather of Amenhotep III; tomb, **570.**
**America, 109–11;** Balboa, **305–6;** the Cabots, **561–2, 616;** Cartier, **651–2;** Columbus' voyages, **846–9, 3182;** Coronado's explorations, **892;** Cortez, **894–5;** De Soto, **999;** domestic animals, **111, 2039, 1684, 662;** Drake, **1030–1;** Hudson, **1690;** Indians, **1765–72, 288–90, 1741;** Magellan's voyage, **2115–6;** Northmen discover, **2526, 2528;** origin of name, **3634;** Pizarro, **2814;** polar exploration, **2859–62;** Ponce de Leon, **2878;** population, **2880–1.** *See also in Index* **Central America; North America; South America.**
**'America',** U.S. national song, **2404.**
**American Academy of Arts and Letters,** organization of writers, musicians, and artists founded 1904 "to further and represent the interests of fine arts and literature"; first president, William Dean Howells; membership limited to 50; **4.**
**American aloe,** or century plant, **42.**
**American Anti-Slavery Society, 1401.**
**American Beauty rose,** *picture,* **3067.**
**American Canoe Association, 442.**
**American Falls,** of Snake R., in s.e. Idaho, **1725.**
**American Federation of Labor, 1947, 1487.**
**American Fur Company,** fur-trading company founded 1808 by John Jacob Astor with trading posts extending across the continent, **3296.**
**American Geographical Society, 1416.**
**Americanism,** defined by great Americans, **3601;** revealed in literature, **116.**
**American ivy,** or Virginia creeper, **3651.**
**American Legion,** patriotic society of World War veterans, **2695.**
**American literature 111–7,** *Study Outline,* **4002;** Amer. spirit in literature, quotations, **116;** colonial, **111–2;** Concord group, **856, 1142;** drama, **1036, 1038;** "Golden Age," **113–4;** national beginnings, **112, 521, 878, 1830;** novel and short story, **2541, 112, 114–5, 117;** oratory, **112.** *See also* under names of chief writers.
**American Museum of Natural History, 1336, 3443.**
**American party,** or "Know-Nothings," **2871.**
**American, Amerind,** or **Red, race, 1764–76, 2956;** civilization, **111;** probable origin, **2133–4.**
**American Red Cross, 2984–6, 3683.**
**American Revolution.** *See in Index* **Revolutionary War.**
**American sardines, 3126.**
**American Sunday School Union, 3396.**
**"American system," 785.**
**American University.** At Washington, D.C.,; co-ed., Meth. Episc.; incorporated 1891 (opened 1914 by President Woodrow Wilson); graduate work only.
**American Woman Suffrage Association, 3778.**
**American woodbine, 3651.**
**American yew, 3830.**
**'America's' Cup, 444–5, 2927.**
**Amer'icus,** Ga. City at junction of Central of Ga. Ry. and Seaboard Air Line; pop. 9010; comm. center for farming region; State Agricultural College; Andersonville, noted Confederate prison, 11 mi. n.
**Americus Vespu'cius, 3634,** *map,* **110.**
**Amerind.** *See in Index* **American race.**
**Amerongen** (*à'mĕr-ŏng-ĕn*), Holland, village 21 mi. s.e. of Utrecht; William II flees to, **3738.**
**Ames** (*āmz*), **Fisher** (1758–1808). Amer. orator and Federalist leader, b. Dedham, Mass.; famous speech for Jay Treaty (1796).
**Ames,** Iowa. City 30 mi. n. of Des Moines; pop. 6270; State College of Agriculture and Mechanic Arts.

**Amesbury,** Mass. Mfg. town for automobiles, carriages, motor boats, shoes, hats, etc., on Merrimack R. 38 mi. n.e. of Boston; pop. 10,036; once home of poet Whittier.
**Amethyst** (*ăm'ĕ-thĭst*), a precious stone, **1409, 1411, 2945, 3233.**
**Am'herst, Jeffrey Amherst, Baron** (1717–97). Brit. soldier, succeeded Abercromby as commander in conquest of Canada from French; led successful expeditions against Louisburg, Ticonderoga, Crown Point, Montreal; gov.-gen. of Brit. N. Amer. 1759–63; commander-in-chief Brit. army 1772–82, 1783–95.
**Amherst,** Mass. Town 18 mi. n. of Springfield; pop. 5550; named for Baron Amherst; Amherst College and Massachusetts Agricultural College; straw hats.
**Amherst,** Nova Scotia. Port and mfg. center on arm of Bay of Fundy, about 90 mi. n.w. of Halifax; pop. 10,000; lumber trade; cars, machinery, furniture, shoes.
**Amherst College,** at Amherst, Mass.; for men; non-sectarian; opened 1821 (charter 1825); arts and sciences; excellent scientific museums; **2170, 3712.**
**Amicis** (*ä-mē'chēs*), **Edmondo de** (1846–1908). Ital. novelist and writer of books of travel; 'Cuore' ('The Heart of a Boy'), which he wrote for children, has passed through 300 editions in Italian and been translated into 20 foreign languages, including English.
**Amiel** (*à-myĕl'*), **Henri Frédéric** (1821–81). Swiss author, man of one book ('Journal', revelation of a Hamlet soul).
**Amiens** (*ä-mē-äṅ'*), mfg. city in France; pop. 93,000; **117–8;** cathedral, **1198,** *pictures,* **117, 186;** in World War, **3804, 3275, 1315.**
**Amiens, Treaty of** (1802), **117, 2394, 3541.**
**Ammersee** (*ä'mĕr-zā*), lake 10 mi. long in s. Bavaria, **1442.**
**Am'meter,** a galvanometer used to measure electric current, **1392, 1113;** "hot-wire," **1114,** *picture,* **1116.**
**Ammon** (*ăm'ŏn*) or **Ammon-Re,** chief god in Egypt. myth., originally local god of Thebes; represented with ram's horns; **1106;** temple at Karnak, **1104,** *pictures,* **1101, 1103, 1105;** temple in Libyan desert, **118.**
**Am'monal,** an explosive, **105.**
**Ammo'nia, 118;** as an antidote, **2855;** in illuminating gas, **1406;** made from "fixed" atmospheric nitrogen, **2512, 571;** used in refrigerating systems, **2990, 2992.**
**Am'monite,** extinct type of mollusk, **3945.**
**Ammonites,** Semitic tribe living e. of the Jordan, **1890;** finally subdued by Judas Maccabaeus.
**Ammo'nium salts, 118, 1235, 104, 3272.**
**Ammunition,** for cannon, **634, 635, 636;** for small arms, **1254, 1256;** gunpowder, **1552–3.**
**Amnesia** (*ăm-nē'sĭ-à*), loss of memory, **2197, 492.**
**Am'nesty proclamation,** (1863), **780.**
**Amoeba** (*à-mē'bà*), the simplest known animal, consisting of one cell, **118–9, 672;** breathing, **2998;** classified among protozoa, **2927, 3944;** locomotion, **1322.**
**Amor** (*ā'mŏr*), Cupid, **939–40.**
**Amor'phous substances, 935.**
**Amos** (*ā'mŏs*), Hebrew prophet (8th cent. B.C.), earliest of "writing prophets" (Book of Amos), **2922, 2923,** *picture,* **2923.**
**Amos Tuck School,** Dartmouth College, **3140.**
**Amoy** (*ä-mŏy'*), China. Treaty port on isl. opposite Formosa; pop. 150,000; exports tea, porcelain, paper.
**Ampelopsis** (*ăm-pĕ-lŏp'sĭs*), or Virginia creeper, **1854.**
**Ampère** (*äṅ-pār'*), **André Marie** (1775–1836), Fr. physicist, **1121, 2787.**
**Ampere** (*ăm-pēr'*), a unit of electric current, **1116.**
**Amphibia** (*ăm-fĭb'ĭ-à*), a class of vertebrate animals including frogs and toads, **127, 3948, 1375;** breathe through gill slits when young, **2998, 3634;** eggs, **1090;** frogs. **1373–5;** place in evolution of animals, **130, 1209, 1277, 2997, 3948,** *diagram,* **128;** salamanders and newts, **3112–3;** toads, **3506–7.**
**Amphictyon'ic league** or **Amphic'tyony** ("dwellers around," "neighbors"). Confederation of anc. Gk. communities centering about some convenient shrine, where they held periodical festivals and discussed political questions; most celebrated of these was the Delphic Amphictyony at the shrine of Apollo.
**Amphineu'ra,** a class of mollusks, including chitons, **2281.**
**Amphion** (*ăm-fī'ŏn*). In Gk. myth., son of Zeus; charmed stones with music of his lyre so they built themselves into walls of Thebes.
**Amphiox'us,** also called lancelet, genus of aquatic sand-burrowing animals resembling primitive vertebrates, **1271, 3947.**
**Amphisbaena** (*ăm-fĭs-bē'nà*), a legless lizard, **2037.**
**Amphithe'aters,** buildings in which the spectators' seats surround the place used by the performers, **3484;** Colosseum at Rome, **3050, 3052,** *pictures,* **3051, 181;** Rom. arena at Nîmes, *picture,* **1342.**
**Amphitrite** (*ăm-fi-trī'tē*). In Gk. myth., sea-queen, daughter of Nereus and wife of Poseidon.
**Am'plifier, electrical.** *See in Index* **Audion.**
**Amritsar** (*ŭm-rĭt'sär*), India, cap. of dist. of same name in Punjab; pop. 153,000; center of Sikh faith; silks, shawls, carpets; **1745;** massacre, **1754.**
**Am'sterdam,** chief city of Netherlands on Amstel R.; pop. 648,000; **119;** diamond-cutting, **1004;** Rijks Museum, **1567.**
**Amsterdam,** N. Y. City on Mohawk R. and Erie Canal, 30 mi. n.w. of Albany; pop. 33,524; carpets, rugs, pearl buttons, knit goods, brooms.
**Amu** (*ä'mų*) or **Amu Darya** (anc. Oxus), great r. of cent. Asia, rising on Pamir Plateau and flowing about 1500 mi. n.w. to Aral Sea; **228, 3556.**
**Am'ulet, 2118, 2120.**
**Amundsen** (*à'mŭn-sĕn*), **Roald** (born 1872), Norwegian navigator and explorer, **119–21;** discovers South Pole, **2864,** *picture,* **2862;** voyage through Northwest Passage, **120, 2863, 617,** *picture-map,* **189.**
**Amur** (*ä-mųr'*) **River,** great navigable r. of e. Asia (2700 mi.); flows s.e. separating Siberia from Manchuria, then n.e. into Sea of Okhotsk opposite isl. of Sakhalin; gives name to province in Siberia n. of river; **230, 2135, 3228.**
**Amylop'sin,** starch-digesting enzyme secreted by pancreas, **1010.**
**Anabap'tists,** a 16th cent. religious sect, **2937.**
**'Anab'asis',** Xenophon's account of the expedition sent by Cyrus the Younger against Artaxerxes, **3823.**
**Anach'ronism,** in biology, **2364.**
**Anacon'da,** Mont., city about 25 mi. n.w. of Butte; pop. 11,668; copper smelters produce about 10 per cent of world's output of copper, from ore out of Butte mines; **2309, 2312, 882.**
**Anaconda,** a snake, **3258, 440,** *picture,* **3259.**
**Anacos'tia River,** tributary of the Potomac, **3684.**
**Anacreon** (*à-năk'rē-ŏn*) (6th cent. B.C.). Gk. lyric poet; famous for songs of love and wine.
**Anadir** (*ä-nà-dēr'*) **River,** in Kamchatka, Siberia, 450 mi. long, **384.**
**Anakim** (*ăn'à-kĭm*). Children of Anak, giant race dwelling in mts. of Palestine before Israelitish conquest (Deut. i, 28); Hebron their chief city; "son of Anak," figurative term for a giant.
**An'alects** of Confucius, **858.**
**Anal'ysis,** in chemistry, **715;** in geometry, **1427;** in grammar, **1495;** in psychology, **2930–1.**
**Analytical geometry,** a form of mathematics in which geometric positions and relations are defined and studied by algebraic methods, **1428.**
**Anam** (*ä-näm'*) or **Annam,** province of Fr. Indo-China; 52,100 sq. mi.; pop. 6,000,000; chief cities, Binh-Dinh, Hué; sugar, rice, cotton, silk, tea; **1777.**
**Anamese** (*ăn-à-mēz'*) **race,** habits and characteristics, **1777, 3227.**
**Ananias** (*ăn-à-nī'as*). An early Christian who, with his wife Saphira, was struck dead for lying (Acts v, 1–10).
**An'apest,** in poetry, **2851.**
**An'archism,** theory that all government is an evil; distinguished from socialism, **3269;** in U.S., **791.**
**Anatolia** (*ăn-à-tō'lĭ-à*), modern name for Asia Minor, **234, 3557–8.**
**Anatol'ic languages, 2771.**
**Anat'omy, 121, 3998;** microscopic (histology), **3841;** of plants, **473;** related to physiology, **2792, 2797.** *See also in Index* **Physiology and anatomy.**
**Anatomy, comparative, 121, 3841;** supports evolution theory, **1209.**
**'Anatomy of Melancholy'.** One of the most famous books in Eng. literature; written by Robert Burton (1577–1640), published 1621; ostensibly a medical treatise on morbidness, but really a vast accumulation of learning on a variety of subjects; much admired by Dr. Johnson and Charles Lamb.
**Anaxagoras** (*ăn-ăks-ăg'ô-rȧs*). Gk. philosopher of 5th cent. B.C., teacher of Pericles; introduced philosophy into Athens; paved way for atomic theory.
**Ancestor worship,** in Africa, **37, 2386;** in China, **858, 744;** in Japan (Shintoism), **1868.**
**Anchises** (*ăn-kī'sēz*), in Rom. myth., Trojan hero, father of Aeneas, **29.**
**Anchor,** in clock and watch escapement, **798,** *picture,* **801.**
**Anchorage,** Alaska. Seaport in s. at head of Cook Inlet; pop. 3500.
**Anchovies** (*ăn-chō'vĭz*), small herring-like fish, abundant in Mediterranean; largest fisheries near Leghorn; related species in Amer. sold under same name; **1190, 1518.**
**'Ancient Mariner',** poem by Coleridge, **1166, 80, 825.**
**Ancona** (*ăn-kō'nà*), Italy, seaport on n.e. coast; pop. 69,000; triumphal arch in honor of Trajan, 115 A.D.; sugar refining, shipbuilding, silk, paper; **26.**
**Ancona,** a breed of fowls, **2911,** *picture,* **2909.**
**Ancre** (*äṅ'kr*). A small Fr. r. flowing s.w. into Somme 8 mi. e. of Amiens; plateau between Ancre and Somme, scene of various "battles of the Somme" in World War.
**Ancus Martius** (*ăn'kŭs mär'shĭ-ŭs*), legendary king of Rome, reigned 638?–614? B.C., **3041.**
**Andalu'sia,** beautiful fertile dist. (formerly province) in s. Spain; chief city, Seville; fruit, olives, grain; **3302, 3303, 3181,** *map,* **3300.**
**An'daman Islands,** in Bay of Bengal, used as Indian penal settlement, **1756, 1763,** *map,* **1744.**
**Andante** (*än-dän'tā*), in music, **2379.**
**Andersen, Hans Christian** (1805–75), Danish author, **121–2, 3134;** birthplace, **996.**

**Anderson, Elizabeth Garrett** (1836–1917). One of earliest Eng. women physicians; women's rights pioneer; first Eng. woman mayor.
**Anderson, Mary** (born 1859) (Mrs. Navarro). Amer. Shakespearean actress (Rosalind, Juliet, Perdita); b. Sacramento, Calif.
**Anderson, Robert** (1805–71), Amer. major-general, b. near Louisville, Ky.; served in Second Seminole, Mexican, and Civil wars; at Ft. Sumter, **776, 777, 1333.**
**Anderson, Sherwood** (born 1876), Amer. author, b. Camden, Ohio ('Winesburg, Ohio'; 'The Triumph of the Egg').
**Anderson,** Ind., 35 mi. n.e. of Indianapolis; r.r., interurban, and industrial center; pop. 29,767; diversified mfrs.; **1760.**
**Anderson,** S. C. Cotton mfg. city and farming trade center; pop. 10,570; birthplace of John C. Calhoun.
**Andersonville,** Ga., village 62 mi. n.w. of Macon; during Civil War seat of Confederate prison in which more than 12,000 men died; burial ground now a national cemetery; **781.**
**Andes** (*ăn'dēz*) **Mts.,** in w. S. Amer.; length 4500 mi., highest peak 22,860 ft.; **122–3, 3284;** animals, **100, 752, 856–7, 2039;** in Argentina, **190, 191, 192;** in Bolivia, **449, 450;** in Chile, **735, 736;** effect on climate, **2741, 3285, 191;** in Colombia, **835, 836;** in Ecuador, **1078, 1079;** minerals, **450, 3289, 736, 2742, 192;** in Peru, **2741, 2742;** Trans-Andean R. R., **3288, 737;** in Venezuela, **3621.**
**Andizhan** (*ăn-dĭ-jän'*) or **Andidjan,** town in w. Turkestan on Syr-Darya R.; pop. 100,000; terminus Trans-Caspian R.R.; center of vast cotton dist.; **3556.**
**Andor'ra,** republic in fertile valley of Pyrenees between France and Spain, under joint suzerainty of France and Span. bishop of Urgel; 191 sq. mi.; pop. 5000; received independence from Charlemagne; sheep-raising, farming; **1194, 3304.**
**Andover,** Mass. Town on Shawsheen R., 22 mi. n. of Boston; pop. 8268; Phillips Andover Academy, for boys; Abbott Academy, for girls; raided by Indians 1698; prominent in witchcraft trials of 1692.
**Andover Theological Seminary.** Founded 1807 by Congregationalists, but open to Protestants of all denominations; affiliated with Harvard and moved 1908 to Cambridge; part of Harvard 1922.
**Andrassy** (*ȧn'drä-shē*), **Count Julius** (1823–90). Hungarian statesman, chief architect of Hungarian state after formation of Dual Monarchy, and its first premier (1867); as Austro-Hungarian foreign minister (1871–79) served at Congress of Berlin (1878) and negotiated Austro-German Alliance (1879).
**Andrassy, Count Julius** (born 1860). Son of the above; figure in Austrian politics during World War.
**Andre** (*ăn'drā*), **John** (1751–80), Brit. spy, executed in Rev. War, **123, 219.**
**Andrée** (*ăn'drā*), **Salomon August** (1854–97?), Swedish scientist and aeronaut, **312, 2862.**
**Andréef** (*ăn-drā'yĕf*), **Leonid** (1871–1919), brilliant Rus. writer, mystic and fatalist; most of his heroes end in madhouse or grave; **3097;** chief works, **3098.**
**Andrew, John Albion** (1818–67). "War governor" (1860–66) of Mass.; b. Windham, Me.; raised first regiment of free negroes in North.
**Andrew, Saint** (d. 707), one of the Twelve Apostles; patron saint of Scotland and Russia, **157, 2745.**
**Andrews, Joseph.** Hero of Fielding's novel, 'Adventures of Joseph Andrews'.
**'Androcles** (*ăn'drō-klēz*) **and the Lion',** story, **2025.**
**Andromache** (*ăn-drŏm'ȧ-kē*), in Gk. myth., wife of Hector, **1626, 1627.**
**Andromeda** (*ăn-drŏm'ĕ-dȧ*), in Gk. myth., daughter of Cassiopeia; saved by Perseus, **2732.**
**Andromeda,** a constellation, **2432,** *picture,* **2433;** position, *chart,* **3343.**
**An'dromedes,** name of a swarm of meteors, **2204.**
**Androni'cus, Livius** (3d cent. B.C.), first Rom. poet, **1966.**
**An'dros, Sir Edmund** (1637–1714), colonial governor of N.Y., N. Eng., and Va., **868, 2170, 2497.**
**An'dros,** Greece. Fertile mountainous isl. in Aegean Sea, 50 mi. e. of Athens; one of the Cyclades.
**Androscoggin** (*ăn-drŏs-kŏg'in*), river in N.H. and Me.; flows 157 mi. to estuary of Kennebec R.; abrupt descent gives immense waterpower; **2128.**
**Anem'ograph,** *picture,* **3709.**
**Anemom'eter, 3708,** *picture,* **3709.**
**Anemone** (*ă-nĕm'ō-nē*), or "wind flower," **123–4;** in myth., **26.**
**Anemone, sea,** a coelenterate animal related to the corals, **3164, 912.**
**An'eroid barometer, 333.**
**Anesthesia** (*ăn-ĕs-thē'sĭ-ȧ*), temporary or permanent loss of power to feel sensation, **124;** produced by hypnosis, **1717.**
**Anesthet'ics, 124–5;** ether, **1207;** importance in surgery, **2193;** opiates, **2585.**
**Angara** (*ăn-gä-rä'*) **River,** in Siberia, important affluent of the Yenisei, **305.**
**Angel-fish,** sometimes called angel-shark, a fish with wing-like fins, belonging to the chaetodont family, found chiefly in tropics; color plate facing **2553.**
**Angelico, Fra** (*frä ăn-jĕl'ĭ-kō*) (1387–1455), the painter friar Fra Giovanni da Fiesole, famous for the unearthly beauty of his saints and angels; he painted only sacred subjects; never touched a brush except with prayer; **2628;** burial place, **3055.**
**Angell, James Burrill** (1829–1916). Amer. educator; b. Scituate, R. I.; president U. of Michigan 1871–1909; minister to China 1880–81.
**Angell, James Rowland** (born 1869). Amer. educator, son of preceding; professor of psychology and dean of faculty, U. of Chicago 1911–20; elected president of Yale 1921.
**Angelo, Michael.** *See in Index* **Michelangelo.**
**"Angels of Mons,"** World War legend, **2386.**
**An'gelus,** a bell rung in Cath. countries morning, noon, and night, inviting faithful to prayer; painting by J. E. Millet, *picture,* **2638.**
**Angers** (*äN-zhā'*), France. Mfg. city on Mayenne R. 190 mi. s.w. of Paris; pop. 84,000; cap. former duchy of Anjou; historic buildings; slate quarries.
**Angiosperms** (*ăn'jĭ-ō-spĕrmz*), the greatest division of seed-bearing plants (Spermatophytes) including the true "flowering" types, **2831;** divided into dicotyledons and monocotyledons, **3173;** include most trees, **3533.** For classification, subdivisions, and complete references, *see* Study Outlines, **3939–43.**
**Angle,** in geometry, **1422–3, 1424, 1425, 1426;** of incidence and reflection in light, **2000;** of refraction, **1987.**
**Angler fish, 1277,** *picture,* **1273.**
**Angles** (*ăng'lz*), Ger. tribe which settled in Britain in 5th cent., **1152, 1194, 997.** *See also in Index* **Anglo-Saxons.**
**Anglesey** (*ăn'gl-sĭ*), Wales, isl. county in Irish Sea connected by bridge with mainland; 276 sq. mi.; pop. 50 000; cattle and sheep, grain; **3664,** *map,* **1159.**
**Angleworm,** or earthworm, **1066–8.**
**An'glicans, 2994.** *See also in Index* **England, Church of.**
**Ang'lin, Margaret** (born 1876). Amer. actress, b. in Ottawa, Canada (Viola in 'Twelfth Night'; Katherine in 'The Taming of the Shrew'; Mrs. Dane in 'Mrs. Dane's Defense').
**Anglo-Saxon Chronicle, 90, 1163;** quoted, **3739.**
**Anglo-Saxons, 1194, 3132, 3234;** conquer Britain, **1152, 997, 674;** Christianity introduced, **636, 1152;** jury system, **1905;** language, **1162;** laws, **1972;** literature, **1163, 384, 563;** rulers, *table,* **1152;** witenagemot, **2687.** *See also in Index* **Britain.**
**Ango'la or Portuguese West Africa,** colony on s.w. coast; 484,800 sq. mi.; pop. 4,000,000; cap. São Paulo de Loanda; coffee, rice, rubber, sugar, fruits, dried fish; *maps,* **3282, 40–1;** occupied by Portugal, **40;** slavery, **3250.**
**Ango'ra** or **Enguri,** city of Turkey, cap. of vilayet of Angora, 215 mi. s.e. of Constantinople; pop. 35,000; mohair cloth; Grand National Assembly held April 1920 set up "Nationalist" government here to administer affairs in Asia Minor, breaking off relations with sultan's government at Constantinople; battle (1402), **3559.**
**Angora cat, 658,** *pictures,* **659.**
**Angora goat, 1476, 1477, 804.**
**Angoulême** (*äN-gȳ-lĕm'*), France. City 60 mi. n.e. of Bordeaux on Charente R.; pop. 38,200; paper, wine, linen; cathedral begun 1101; birthplace of Margaret of Navarre.
**An'gra,** Azores, pop. 10,000; **288.**
**Angus** (*ăn'gŭs*), **Richard B.** (born 1831). Canadian financier and philanthropist, member of syndicate which completed the construction of Canadian Pacific Ry.
**Anhalt** (*än'hält*). Republic in cent. Germany, former duchy; 888 sq. mi.; pop. 332,000; cap. Dessau; agriculture; coal and other minerals.
**Anhwei** or **Nganhwei.** Inland province of China in e.; 54,810 sq. mi.; pop. 14,100,000; cap. Anking.
**Ani** (*ä'nē*), a tropical bird, **405.**
**Aniline** (*ăn'ĭ-lĭn*) **dyes, 1050, 814, 384, 1779;** industry in Germany, **1050, 502, 1444.**
**Animal breeding.** *See in Index* **Live stock.**
**Animal'cule,** an animal of microscopic size; rotifers or "wheel animalcules," **3814, 3945;** slipper animalcules, **3944.**
**Animal Industry, Bureau of,** U.S., **3600.**
**Animal magnetism,** or hypnotism, **1717–8.**
**Animals, 126–31, 393–9, 3841;** adaptations caused by struggle for existence, **127, 1076, 1210;** beginnings of life on earth, **1062, 1209;** behavior, **131;** classification, **127, 412;** development (embryology), **1140–1;** distinguished from plants, **127, 393–4;** distribution (ecology), **1076, 795,** *picture,* **397;** domestication a step in civilization, **772, 1018, 235;** evolution, **128–30, 1209–10;** "family tree," *picture,* **128;** hibernation, **1646–7;** "intelligence" in, **130–1;** longevity, **127,** *picture,* **126;** lowest forms (protozoa), **2927;** migrations, **2231–4;** nature study, **2406–17;** parasites and parasitism, **2677–80;** perfumes from, **2728;** pets, care of, **2755–8;** phosphorescence, **2776;** protective coloration, **2923–6;** taxidermy, **3442–3.** For complete analysis and references, *see* Study Outlines, **3944–52.** *See also in Index* **Biology; Cell; Ecology; Embryology; Evolution; Heredity; Reproduction,** etc.; and the individual animals and animal groups such as **Birds; Fish: Insects.**
**Animals, prehistoric, 132–8, 1418–20, 666–9;** archaeopteryx, **138;** dinosaurs, **132–7;** extinct horse types,

**1683,** *pictures,* **1682;** fossil reptiles classified, **2997;** ichthyosaurs, **136;** mammoth and mastodon, **2132,** *pictures,* **1126, 667;** pterodactyls, **134, 136;** tuatara, "the living fossil," **2038;** woolly bison, *picture,* **429.**

**Animal worship, 2386;** in anc. Egypt, **1106, 658, 2369, 923;** in India, **525, 1748, 3259, 816, 2291–2.**

**An'imism, 1748.**

**Anise** (*ăn'ĭs*), a plant of the parsley family, native of n. Africa, widely cultivated in Germany, s. Europe, India; aniseed, **3318.**

**Anjou** (*ăn-zhy'*), great fief of medieval France on both sides of Loire R.; cap. Angers; held by England 1154–1204; **1195, 1633, 1896,** *map,* **1351.**

**Ankle, 1322.**

**Anna,** a coin, **1752.**

**'Anna Kare'nina'.** Novel by Tolstoy and its heroine; intense psychological study with background of modern social life; character of Levin partly autobiographical.

**Annam.** *See in Index* **Anam.**

**Annap'olis,** Md., state cap.; pop. 9000; **139;** early history, **2163;** naval academy, **2418,** *picture,* **2419;** old capitol, *picture,* **2163.**

**Annapolis,** Nova Scotia, town on arm of Bay of Fundy, 95 mi. w. of Halifax; pop. 1000; founded as Port Royal, **2538.**

**Annapolis Convention.** At Annapolis, Md., Sept. 1786; N.Y., N.J., Pa., Del., and Va. represented; passed resolution calling for another convention (the Constitutional Convention) the next year.

**Ann Arbor,** Mich., residential city 35 mi. w. of Detroit; pop. 19,516; shipping point for rich agricultural region; various mfrs.; state univ., **2227,** *picture,* **2225.**

**Anne** (*ăn*), queen of England (1665–1714), **139;** deserts James II, **1861;** favors Marlborough, **2150;** literature under, **1165.**

**Anne Boleyn** (*bul'ĭn*) (1507–36), queen of Henry VIII of England, **447, 1636.**

**Anne of Austria** (1601–66). Daughter of Philip III of Spain; queen of Louis XIII of France; regent during minority of her son Louis XIV; her chief minister Mazarin.

**Anne of Beaujeu** (1462?–1522), sister of Charles VIII and regent of France 1483–90, **696.**

**Anne of Brittany** (1477–1514). Queen of Charles VIII of France and later of Louis XII; united Brittany to France.

**Anne of Cleves** (*klēvz*) (1517?–57), 4th queen of Henry VIII of England, **1636.**

**Anneal'ing,** process of heating substance and cooling slowly to make it less brittle; glass, **1472, 1474;** iron, **1824.**

**An'nelids,** animal group containing the segmented worms, **3814, 3945.**

**'Annie Laurie'.** Famous 18th cent. Scotch song by William Douglass; a real person, daughter of Sir Robert Welton, of the Maxwelton family.

**An'niston,** Ala. Mfg. and trade center 56 mi. n.e. of Birmingham; pop. 17,734; cast-iron pipes, other iron and cotton mfrs.; founded 1873 by Woodstock Iron Co.

**Annual parallax** of stars, **3341.**

**Annual plants, 2830.**

**An'nular eclipse,** defined, **1074.**

**Annunzia'ta, Order of the, 979.**

**Annunzio** (*ăn-nun'dzi-ō*). **Gabriele d'** (born 1864). Ital. novelist, dramatist, poet; **1833, 1038;** seizes Fiume, **1286, 3812.**

**Anode** (*ăn'ōd*), defined, **1125;** of Crookes tube, *picture,* **3825.**

**Anodynes** (*ăn'ō-dīnz*), **1042.**

**An'olis,** a lizard, **2038.**

**Anopheles** (*ȧ-nŏf'ē-lēz*) **mosquitoes, 2334–8, 2651–4.**

**Ano'sia,** a butterfly genus, colorplate facing **548.**

**Anselm** (*ăn'sĕlm*), **Saint** (1033–1109), archbishop of Canterbury 1093–1109; and William Rufus, **3740.**

**Anseres** (*ăn'sēr-ēz*), waterfowl, **412.**

**An'sgar** or **Anscha'rius** (801–865), Frankish missionary to Scandinavia and n. Germany, first bishop of Hamburg, **997.**

**Anso'nia,** Conn. Mfg. center 8 mi. n.w. of New Haven on Naugatuck R.; pop. 17,643; machinery, brass and copper goods, clocks, electrical supplies.

**Ant, 139–43, 145;** fossil, *picture,* **106;** harbored by acacia, *picture,* **2825;** instances of "intelligence," **130, 131;** mandibles, *picture,* **1782;** nests and community life, **139–41;** protect coffee plants from pests, **822;** use aphids as "cows," **154.**

**Antaeus** (*ăn-tē'ŭs*), giant slain by Hercules, **1640.**

**Antakiyeh** (*ăn-tȧ-kē'yā*), city of Syria (anc. Antioch), pop. 25,000; **150.**

**Antananarivo** (*ăn-tȧ-nä-nȧ-rē'vō*) or **Tananarivo,** Madagascar, cap. and largest city; pop. 63,000; **2106.**

**Antarc'tic beech, 3533.**

**Antarctic circle, 1969, 3862;** first crossed by Capt. Cook, **874, 2863.**

**Antarctic continent** (Antarctica), **145,** *picture-map,* **144;** elevation, **2791;** exploration, **2862–4, 3149–50;** ice cap, **1465;** penguins, **2715–6, 131.**

**Antarctic** or **Humboldt current, 1078, 2741.**

**Antarctic Ocean,** also called **Great Southern Ocean,** waters surrounding Antarctic Continent; some modern geographers consider these waters as southern ends of Atlantic, Pacific, and Indian oceans; **2554.**

**Antares** (*ăn-tā'rēz*), a star, **3342.**

**Ant-eater,** a mammal, **145–6;** altitude range, *picture,* **397;** Australian (echidna), *picture,* **266;** related to armadillo, **211;** "spiny," **1047.**

**Antelope, 146,** *pictures,* **147;** altitude range, *picture,* **397;** horns, **1680;** related to cattle, **663.**

**Anten'nae,** of animals, **1787;** ant, **139,** *pictures,* **139, 141;** bee, *picture,* **359;** bee drone, **362;** beetle, **371;** crab, **912,** *pictures,* **913;** crawfish, *picture,* **915;** different in moths and butterflies, **546,** *pictures,* **547;** mosquito, **2336,** *picture,* **2334;** lacking in spiders, **3326;** lobster, **2041,** *pictures,* **2041;** snail, **3256.**

**Antennae,** or aerials, in radio apparatus, **3760, 3761, 3765.**

**Anten'nule,** a small feeler in front of the true antennae of crustaceans; of crawfish, *picture,* **915.**

**An'ther,** in plants, **1304,** *pictures,* **1306, 1307, 1308;** yellow water-lily, *picture,* **474.**

**Autherid'ium, 2339, 2032, 3173.**

**Anthony** (*ăn'tō-nĭ*), **Saint,** (250?–356?), b. in Egypt, lived in solitude for years, resisted many strange temptations which are favorite subjects in literature; founded Christian monasticism, **2298.**

**Anthony of Padua, Saint** (1195–1231), most celebrated of followers of St. Francis d'Assisi; wonderful preacher; legends tell of fishes leaping from the water to hear him; basilica at Padua, *picture,* **1846.**

**Anthony, Susan B.** (1820–1906), leader in Amer. suffrage movement, **146, 148–9, 3778.**

**Anthophyl'lite,** variety of asbestos, **225.**

**Anthozo'a,** class of coelenterate animals, **3944;** includes sea anemones, **3164,** corals, **886.**

**An'thracene oil,** obtained from coal-tar, **814.**

**An'thracite** or **hard coal, 812, 642,** in Colo., **841;** in Pa., **2720, 3153;** in W.Va., **3728.**

**An'thrax,** an infectious disease; bacillus discovered, **1450;** Pasteur discovers vaccine, **2692.**

**Anthropoi'dea, 2134, 153–4.**

**Anthropology** (*ăn-thrō-pŏl'ō-jĭ*), the science of man, **149, 3866–9;** classification of man by hair, **1560,** by language, **2770–2,** by skin color, **2956,** by skull-measurements, **2956;** development of civilization, **771–4, 775;** origin of man, **2133–4, 128, 1209;** prehistoric man, **2133–4, 2956, 666–70;** races of mankind, **2956–7;** relations to sociology, **3270.** *See also in Index* **Archeology; Civilization; Man; Races of mankind; Sociology.**

**Anthropom'etry,** branch of anthropology, **149.**

**Anthropomor'phism,** representation of God, or of the gods, in human form; derivation of word, **1534.**

**Anti-aircraft gun,** *picture,* **633.**

**Antibacte'rial serum,** defined, **151.**

**An'ticline,** a rock fold with the convex side upward, *picture,* **2751.**

**Anticosti** (*ăn-tĭ-kŏs'tĭ*), Quebec, large barren isl. in Gulf of St. Lawrence; fishing and game preserve; **3108, 1900;** *map,* **602–3.**

**An'tidotes** for poisons, **2854–5.**

**Antietam** (*ăn-tē'tăm*), Md., battle of, **149, 2095, 1140, 778.**

**Antifed'eralists** or **Republicans,** oppose constitution, **2871.** *See in Index* **Federalist party; Republican party.**

**Anti-friction alloys, 1370, 150, 3504.**

**Antigone** (*ăn-tĭg'ō-nē*), in Gk. myth., daughter of Oedipus; follows father into exile; buries brother in defiance of king's order, **2566;** leading Oedipus, *picture,* **1535;** tragedy by Sophocles, **1536.**

**Antilles** (*ăn-tĭl'ēz*), all W. Indies isls. except Bahamas, **3718;** *maps,* **938, 2514–5.**

**Antilochus** (*ăn-tĭl'ō-kŭs*), in Gk. myth., beautiful youth, friend of Achilles; one of suitors of Helen of Troy; killed by Memnon, **2196.**

**An'timony,** a metallic element, **150;** found in Afghanistan, **31,** in Algeria, **97,** in Bolivia, **450,** in Colombia, **836;** in tartar emetic, **3438;** used in alloys, **150, 99, 3572.**

**An'tin, Mary,** pen name of Mary Antin Grabau (born 1881), Amer. author, b. Polotzk, Russia ('The Promised Land', autobiography): **1739–40.**

**Antioch** (*ăn'tĭ-ŏk*), Syria, anc. center of Gk. culture; modern town Antakiyeh; pop. 25,000; **150;** bishop formerly called "pope," **2664;** in Crusades, **929, 3426.**

**Antioch College.** At Yellow Springs, Ohio; non-sectarian; co-ed.; founded 1852, Horace Mann first president; arts and sciences, engineering, normal work, music.

**Antiochus** (*ăn-tī'ō-kŭs*) **I, Soter,** king of Seleucid dynasty in Syria; ruled 280?–261 B.C.; conquers Palestine, **1657.**

**Antiochus III, the Great,** of Syria; ruled 223–187 B.C.; sheltered Hannibal and warred with Rome; defeated at Magnesia, **1657.**

**Antiochus IV, Epiphanes** (*ĕ-pĭf'ȧ-nēz*), of Syria; ruled 176–164 B.C.; oppresses Jews, **1891.**

**Antipater** (*ăn-tĭp'ȧ-tẽr*) **the Idumean** (d. 43 B.C.), **1891.**

**Antiphonal** (*ăn-tĭf'ō-năl*) **singing, 2376.**

**Antipodes** (*ăn-tĭp'ō-dēz*) ("with the feet opposite"). A region on the opposite side of the earth. Also, small uninhabited isl. s.e. of New Zealand; so called because nearly opposite London, England.

**An'tipope,** a usurping pontiff, or one elected in opposition to the pope canonically chosen; Clement VII, **3607;** Benedict XIII, **382, 1541.**

**Antipyret'ics,** anti-fever drugs, **1042.**

**Antiquarian,** size of paper, **2673.**

**Anti-rust alloy,** 2507.
**Anti-Saloon League,** 2920.
**Antisep'tics,** 150–1; bichloride of mercury, **2200;** borax, **464;** carbolic acid, **642;** creosote, **918, 814;** cresols (lysol and creolin), **814;** formaldehyde, **1331–2;** iodine, **1802;** Lister, **150, 1799, 1687;** Pasteur, **2692;** silver nitrates, **3242.**
**Anti-slavery movement.** *See in Index* **Abolitionist movement; Slavery.**
**Antitoxins** (*ăn-tĭ-tŏks'ĭns*), **151–2, 1450, 3260.**
**Antium** (*ăn'shĭ-ŭm*), Italy. An anc. flourishing seaport 35 mi. s.w. of Rome; birthplace of Nero; now Anzio, a bathing resort.
**Antivenin** (*ăn-tĭ-vē'nĭn*), **3260.**
**Antlers, 1680;** deer, **979,** *picture,* **981;** moose, **2325,** *picture,* **2324;** reindeer, **2993;** wapiti, **3669.**
**Ant-lion,** an insect, **152.**
**Antofagasta** (*ăn-tō-fä-gäs'tä*), seaport in n. Chile, cap. of province of same name; pop. 70,000; ships much nitrate; silver smelters; seized by Chile, **448.**
**Antoninus Pius** (86–161 A.D.), Rom. emperor; succeeded 138 A.D.; adopted as son and successor by Hadrian; **3048, 2147.**
**Antonio** (*ăn-tō'nĭ-ō*), the merchant, friend of Bassanio, in Shakespeare's 'Merchant of Venice', **2199.**
**An'tony, Mark** (83–30 B.C.), Rom. orator and statesman, **258, 789,** *picture,* **788;** at Caesar's funeral, **3049;** decrees Cicero's death, **765–6.**
**Antrim.** County in Ulster, Ireland; 1176 sq. mi.; 90 mi. of seacoast; fisheries, mining, agriculture.
**Antwerp** (*ănt'wĕrp*), 2d city of Belgium; pop. 310,000; on Scheldt R. 50 mi. from sea; **152–3, 373,** *picture,* **375;** "city of Rubens," **3076;** dialect, **376;** lace, **1950;** Scheldt R., **3136.**
**Anu'bis.** An Egypt. deity, with human body and head of jackal; conducted souls of dead to lower world and assisted Osiris at final judgment.
**Anuradhapura** (*ä-nu̯-räd-hä-pu̯'rä*), anc. cap. of Ceylon, **685.**
**An'zacs.** Members of the Australian-New Zealand Army Corps in World War; served in Gallipoli campaign, later in France; word made by taking initial letters.
**Aorta** (*ā-ôr'tà*), an artery, **1617,** *picture,* **1616.**
**Aoudad** (*ä'u̯-dăd*), or Barbary sheep, **3198.**
**Apaches** (*à-păch'ēz*), tribe of roving predatory Indians of s.w. U. S., **202, 1773, 2467;** Kit Carson, **650;** water-jars, *picture,* **342.**
**Apalachi** (*ăp-à-lăch'ē*) or **Apalachico'la,** Indian tribe of s.e. U.S., formerly ranging from St. Marks R., Fla., to Appalachian Mts.; now extinct; **1766.**
**Apalachicola River.** In w. Florida; 90 mi. long.
**Apar** (*ăp'ăr*), an armadillo, **211.**
**Apatite** (*ăp'à-tīt*), a glassy phosphate of calcium containing chlorine or fluorine; relative hardness, **2248;** yields phosphorus, **2777.**
**Ape, 153–4;** chimpanzee, **738–9;** evolutionary position among animals, *diagram,* **128;** gibbon, *picture,* **2288;** gorilla, **1491;** not a monkey, **2288;** orang-utan, **2590;** modified vertebrate structure, **3634.**
**Apeldoorn** (*ä'pĕl-dōrn*), Netherlands. City 17 mi. n. of Arnhem; pop. 46,000; summer palace of queen; paper mills.
**Apelles** (*a-pĕl'ēz*) (4th cent. B.C.), most celebrated Gk. painter; court painter of Philip of Macedon and Alexander the Great; **1529.**
**Ape-man,** *Pithecanthropus erectus,* **2133.**
**Apennine** (*ăp'ĕ-nīn*) **Mts.,** in Italy; 800 mi. long; highest peak 9585 ft., **154, 1190, 1835.**
**Apet'alous plants, 1305, 3940;** examples among trees, **3533.**
**Aphasia** (*à-fā'zhĭ-à*), defined, **492.**
**Aphids** (*ăf'ĭdz*), "green" or "plant" lice, **154;** "domesticated" by ants, **141;** killed by spraying, **3330;** phylloxera, the "grape aphid," **1501;** preyed on by hover-fly, **1791;** reproduction, **1786, 401.**
**Aphrodite** (*ăf-rō-dī'tē*), in Gk. myth., goddess of love and beauty, **155;** Adonis, **26, 123;** Atalanta, **248;** judgment of Paris, **3542, 2680;** myrtle, **2385;** punishes Narcissus, **2397;** statue ('Venus de Milo'), **155, 1530,** *picture,* **1203.**
**Apia** (*ä'pē-ä*), Samoa, trade center of Samoan group; pop. 1500; **3120.**
**Apiaceae** (*ā-pī-ā'sē-ē*), the parsley family, including celery, parsnips, and carrots, **3942.**
**A'piary,** for bees, **362.**
**Apidae** (*ăp'ĭ-dē*), the bee family, **364.**
**Apis** (*ā'pĭs*), in Egypt. myth., sacred bull worshipped at Memphis; represented an incarnation of the god Osiris; **2602, 1106.**
**Apis,** the genus of honey-bees, **364.**
**Apistus,** a fish, *picture,* **1271.**
**Apocalypse** (*à-pŏk'à-lĭps*) ("revelation"), last book of New Testament, **1719.**
**Apocar'pous flowers, 3939.**
**Apocrypha** (*à-pŏc'rĭ-fà*), **390.**
**Apollo** (*à-pŏl'ō*), in Gk. myth., god of light, **155–7;** aids Trojans, **1626;** causes death of Achilles, **8;** Daphne, **962;** Hermes, **1644;** Hyacinthus, **1706;** Midas, **2230;** Niobe, **2510;** oracle at Delphi, **991.**
**Apollo Bel'vedere,** famous Gk. statue, **157, 1532,** *pictures,* **3159, 156.**
**Apollonius** (*ăp-ō-lō'nĭ-ŭs*) **Molon,** Gk. orator, **3011.**
**Apollonius Rhodius** (222–181 B.C.), Gk. poet, **1538.**
**Apollyon,** "the destroyer"; "the angel of the bottomless pit" (Rev. ix, 11); in Bunyan's 'Pilgrim's Progress', **536.**
**Ap'oplexy,** brain disease, **491.**
**Apostle** (*à-pŏs'l*). Name applied in later days to others than the Twelve: Apostle of the English, St. Augustine; of the French, St. Denis; of Germany, St. Boniface; of the Highlanders, St. Columba; to the Indians, John Eliot; of the Indies, Bartolomé de Las Casas; of Ireland, St. Patrick; to the Scots, John Knox.
**Apostles, the Twelve, 157, 1888.**
**Apostrophe,** use of, **2936.**
**Apothecaries' pound, 3715.**
**Appalachian** (*ăp-à-lăch'ĭ-ăn*) **Mts.,** in e. N. America; highest peak, 6711 ft.; **158, 3580, 3870;** effect on climate, **2516;** effect on early settlement, **158, 2515, 3581, 3648;** forest reserve, **1331;** geological history, **158, 2516, 3580, 2358;** minerals, **3590, 2720, 2754, 3650;** routes of travel, **3581–2, 158, 2567;** New England, **2125, 2453, 3632;** Middle Atlantic States, **2457, 2718, 3647–8, 3720;** S. Atlantic States, **1431, 2517, 2518, 3290–1.**
**Apparent solar time, 3500.**
**Appeals, Circuit Courts of, 909.**
**Appen'dix, vermiform,** worm-like tube attached to lower right-hand end of large intestine; rudimentary character, **1209.** Inflammation of appendix is called appendicitis.
**Appenzell** (*ä-pĕn-tsĕl'*), canton of Switzerland traversed by Alps; textile industry, **3416.**
**Appercep'tion, 158–60.**
**Ap'pian,** Rom. historian, flourished in reigns of Trajan and Hadrian, **1538.**
**Appian Way,** oldest and most famous of Rom. roads, Rome to Brundisium, 360 mi.; begun 312 B.C.; **3052, 3056,** *picture,* **3049;** Spartacans crucified, **3310.**
**Apple, 160–1;** blossoms, *pictures,* **2408, 3535;** botanical classification, **3066, 3941, 3533;** codlin moth, **820;** cultivation, **1377–80;** malic acid, **10;** orchards in Idaho, **1727,** Mich., **161, 2224,** N. Y., **161, 2485,** Nova Scotia, **2538,** *picture,* **604,** Ore., **161, 2596,** Wash., **161, 3687.**
**Apple of Discord, 3542, 2680.**
**Apple of Sodom,** or horse nettle, **2509.**
**"Appleseed, Johnny,"** nickname of Jonathan Chapman (1775–1847), eccentric Amer. pioneer, **161.**
**'Apples of Iduna, The',** story, **3135–6.**
**Appleton,** Wis., industrial city on Fox R.; pop. 19,561; falls furnish power for paper mills and other mfrs.; Lawrence College; **3772.**
**Applied science, 3144.**
**Appomattox** (*ăp-ō-măt'ŭks*) **Court House,** Va., village 20 mi. e. of Lynchburg; Lee's surrender, **1498–9, 1934, 799,** *picture,* **781.**
**Apponyi** (*ăp-pōn'yē*), **Albert, Count** (born 1846). Hungarian statesman of liberal tendencies, a parliamentary leader for more than 40 yrs.; generally regarded as foremost figure in Hungarian politics; his father, Count George (1808–99), Hungarian chancellor, was instrumental in establishing dual monarchy of Austria-Hungary.
**Appos'itive,** in grammar, **2537.**
**Appren'tice,** in medieval gilds, **1460, 3655;** shoemaker, **3221.**
**Apremont** (*ä-prē-mōn'*), France, a town 20 mi. n.w. of Verdun; on Aire R. near e. edge of Argonne Forest; in World War, **194.**
**Apricot** (*ā'prĭ-cŏt*), **161–2, 716;** introduced into Europe, **932.**
**April,** 4th month in calendar, **162;** birthday stone, **1409.**
**April Fools' Day, 162, 1673.**
**Apse** (*ăps*), in architecture, **180,** *diagram,* **186.**
**Apsheron** (*ăp-shā-rōn'*) **Peninsula,** promontory of Transcaucasia, extending for 40 mi. on w. coast of Caspian Sea; forms e. extremity of Caucasus Mts.; **654.**
**Apteryx** (*ăp'tĕr-ĭks*), or kiwi, a New Zealand bird, **3949;** foot, *picture,* **409.**
**Apuleius** (*ăp-yu-lē'ŭs*). **Lucius** (born 125? A.D.), Rom. philosopher and satirist, **2539.**
**Apu'lia,** dept. of s.e. Italy; 7376 sq. mi.; pop. 2,240,000; **1835, 1841.**
**Apuré** (*ä-pu̯'rā*) **River,** in Venezuela, **2600,** *map,* **3622.**
**Aquae Sextiae** (*ā'kwē sĕx'tĭ-ē*), anc. name of Aix; here Marius defeated Teutones (102 B.C.), **3046.**
**Aqua re'gia, 1482.**
**Aquarium** (*à-kwā'rĭ-ŭm*), **162, 3852;** Battery Park, **2488,** exterior, *picture,* **2492;** best form for goldfish, **1483;** at Naples, **2390;** turtles in, **2758;** water-bugs, **3698.**
**Aqua'rius,** sign of zodiac, **3840.**
**Aqueducts** (*ăk'wĕ-dŭkts*), **163–4;** Catskill, **164, 2495,** *pictures,* **2486, 3701;** Croton, **164,** *pictures,* **2486, 3702;** Los Angeles, Calif., **164, 2063;** of anc. Romans, **163–4, 3702, 3549, 3552;** at Segovia, *picture,* **163;** use of siphons, **3243,** *pictures,* **3694, 164;** Winnipeg, Manitoba, **3752.**
**Aqueous** (*ā'kwē-ŭs*) **humor,** of the eye, **1214.**
**Aquilar, Martin,** 2596.
**Aquileia** (*ă-kwĭ-lā'yä*), Italy. Town 22 mi. n.w. of Trieste; pop. about 2000; once one of chief cities of Rom. Empire with 400,000 pop.; destroyed by Attila 452 A.D.
**Aquinas** (*à-kwī'nàs*), **Saint Thomas** (1227–74), theologian and scholastic philosopher, called the "Angelic Doctor"; next to St. Augustine in influence on Catholic doctrine ('Summa Theologiae', a summary of general knowledge as well as theology); **2773.**
**Aquitaine** (*ăk-wĭ-tān'*) or **Aquitania,** old Fr. province and duchy, *map,* **1351;** under Eng. crown, **2064, 1195, 3015, 1087–8.**
**'Aquita'nia',** ship, **3218,** *picture,* **3217.**

**Arabia** (*ȧ-rā'bĭ-ȧ*), vast peninsula of s.w. Asia; pop. 6,000,000; 1,250,000 sq. mi.; **165–8,** *maps,* **165, 232–3;** climate, **2973;** coffee, **820;** foreign trade, **24;** glass-making, **1474;** history, **166, 232, 3557, 3812;** Mecca, **2186–7;** Mohammed and Mohammedanism, **2275–8;** perfumes, **2729;** spices, **3317.**
**Arabia Felix, 165.**
**Arabian camel, 590–1.**
**Arabian desert,** Africa, **1092.**
**Arabian horse, 1685.**
**'Arabian Nights', 168–72, 305, 2738,** *picture,* **304;** story of Aladdin and the lamp, **169–72.**
**Arabian Sea,** portion of Indian Ocean between Arabia and India, **1763, 228,** *map,* **232–3.**
**Ar'abic numerals, 2542–3, 198.**
**Arabi Pasha** (*ȧr'ȧ-bī pā'shȧ*) (1839–1911), Egypt. rebel; defeated by Wolseley (1882) at Tel-el-Kebir; **88.**
**Arabs, 165–8;** story, 'Children of the Desert', **167–8;** bring sugar plant to Europe, **3385;** caravans, **3105–6;** commerce, **2278, 3106;** culture, **232, 2278, 3300;** horses, **1685;** invade n. Africa, **2323, 2328, 3541, 3550,** Spain, **2323, 3304,** Syria, **3426;** language, **1624, 3425;** in Palestine, **2643, 2646;** religion, **2275–6.**
**Araceae** (*ȧ-rā'sĕ-ē*), the Arum family of plants, **3939.**
**Arachne** (*ȧ-răk'nē*), in Gk. myth., maiden turned into spider, **3322, 249.**
**Arach'nids,** a class of arthropod animals, **3325, 3946;** evolutionary position, *diagram,* **128;** mites, **1787, 3322;** origin of name, **3322;** scorpions, **3145;** spiders, **3320–6.**
**Arad** (*ȧr-ȧd'*), Rumania. On Maros R.; pop. 63,000; formerly strong fortress; in Hungarian rev. of 1848 scene of Kossuth's last proclamation; one of world's largest distilleries.
**Arafat** (*ă-rä-fät'*), **Mt.,** holy mt. near Mecca, **2187.** In Mohammedan legend it was scene of reunion between Adam and Eve after their fall from Paradise.
**Ar'ago, Dominique F.** (1786–1853), Fr. astronomer and physicist; founds "electrodynamics," **1121.**
**Aragon** (*ăr'ȧ-gŏn*), former kingdom of n.e. Spain, now captaincy-general, **1195, 3304,** *map,* **3300;** united with Castile and Leon, **1832.**
**Araguaya** (*ă-rä-gwī'yȧ*) **River,** Brazil, 1300 mi. long; joins Tocantins R.; *map,* **494.**
**Ar'al, Sea of,** second largest body of water in Asia, **172, 228, 654.**
**Aram** (*ā'rȧm*), **Eugene** (1704–59). Eng. schoolmaster, hanged for murder; subject of novel by Bulwer-Lytton and poem by Hood.
**Aramaic** (*ăr-ȧ-mā'ĭk*) **language, 3425;** used by Jews, **1624–5, 388.**
**Arame'ans,** an anc. branch of Semites centered in n. Syria and Mesopotamia, **3425;** alphabet, **100.**
**Aramis** (*ă-rȧ-mēs'*), one of the "Three Musketeers" in Dumas' novel; mild and gracious; finally enters the church; **1047–8.**
**Araneida** (*ăr-ȧ-nē'ĭ-dȧ*), the spider order of arachnids, **3325, 3946.**
**Aranyakas** (*ä-rŭn'yȧ-kȧs*), Hindu sacred books, **1755.**
**Arapahoes** (*ȧ-răp'ȧ-hōz*), Indian tribe of Algonquian stock; formerly ranged widely over Rocky Mt. plains; **1767, 844, 2576.**
**Ararat** (*ăr'ȧ-răt*), **Mt.,** double volcanic peak in e. Armenia, **232.**
**Arauca'nian Indians,** the aboriginal inhabitants of s. Chile, **738.**
**Araucaria** (*ăr-ȧ-kā'rĭ-ȧ*), trees, **3533.**
**Arau'ca River,** Venezuela, **2600.**
**Ar'awak Indians,** tribe in Guiana and Venezuela; gave name to linguistic stock Arawakan, once numerous and powerful; **3622.**
**Arbela** (*ăr-bē'lȧ*), modern Erbil or Arbil, town in Mesopotamia, s.e. of Mosul; battle of (331 B.C.), **86, 2738.**
**Ar'bitrage,** in grain trade, **441.**
**Arbitra'tion, 172–3;** *Alabama* Claims, **73;** Alaskan boundary, **79.**
**Arblay, Frances d'.** *See in Index* **Burney, Fanny.**
**Arbor Day, 173.**
**Arbor-vitae** (*ăr-bôr-vī'tē*), the "white cedar," **671,** *picture,* **670,** favored for hedges, **1627–8.**
**Arbuckle Hills,** Okla., **2576.**
**Arbuthnot** (*ăr'bŭth-nŏt*), **John** (1667–1735), Scotch physician and satirist, friend of Pope and Swift; originates name "John Bull," **2507.**
**Arbu'tus, trailing,** a wild flower, **173.**
**Arc,** in geometry, **1423.**
**Arc** (*ărk*), **electric,** in street lighting, **1123,** *picture,* **1123;** Sir Humphry Davy, **1121;** temperature attained, **1618;** used in electric furnace, **1382–3,** in fixing atmospheric nitrogen, **2510–1,** in motion-picture projector, *picture,* **2353,** in welding, **3716.**
**Arcadia** (*ăr-kā'dĭ-ȧ*), dist. in Greece, **173–4,** *map,* **1518.**
**'Arcadia',** by Sir Philip Sidney, **2539.**
**Arc de Triomphe** (*ărk dē trē-ôńf'*). Paris, **2682,** *pictures,* **2681, 2683.**
**Arch,** in building, **174;** in Babylonian architecture, **176;** in bridge-building, *pictures,* **508;** Gothic, **184, 186,** *picture,* **187;** Renaissance, *picture,* **179;** Roman, **177,** *pictures,* **181, 163, 1840, 1342, 3051;** Romanesque, **180.**
**Arch,** of foot, **1324.**
**Archaeopteryx** (*ăr-kĕ-ŏp'tĕr-ĭks*), a primitive bird, known through fossil remains, **138, 3949,** *picture,* **401.**
**Archangel** (*ărk-ān'gĕl*), Russia, seaport on Dvina R. near White Sea; pop. 44,000; export trade, **1188;** ice-bound, **3085.**
**Archangel tar, 3436.**
**Archbishop, 763;** of Canterbury, **636;** in Parliament, **2687, 2689;** pope as, **2665.**
**Archean** (*ăr-kē'ȧn*) **period,** in geology, **1418,** *picture,* **1419.**
**Archegonium** (*ăr-kē-gō'nĭ-ŭm*), **2032, 2339, 3173.**
**Archeology** (*ăr-kĕ-ŏl'ō-jĭ*). The science which studies the relics of man's handiwork, such as buildings and utensils.
**Archeozoic** (*ăr-kĕ-ō-zō'ĭk*) **era,** in geology, **1418, 1420, 1422,** *picture,* **1419.**
**Archer,** a sign of the zodiac, **3840.**
**Archichlamydeae** (*ăr-kĭ-kla-mĭd'e-ē*), a sub-class of dicotyledonous plants, **3940–2.**
**Archilochus** (*ăr-kĭl'ō-kŭs*) (7th cent. B.C.), lyric poet, **1536.**
**Archimedes** (*ăr-kĭ-mē'dēz*) (287–212 B.C.), Gk. mathematician and inventor, **174–5, 2787;** burning glass, **1620;** catapult, *picture,* **1796;** inventions, **1798,** lever, **2188, 174;** specific gravity, **1508–9.**
**Archimedes' principle,** in mechanics, **174, 1508–9.**
**Archimedes' screw, 175,** *picture,* **3696.**
**Architecture** (*ăr'kĭ-tĕk-tūr*), **176–89,** *Study Outline,* **4004–6;** Aegean, **176, 28;** American, **189, 528–31, 2489;** Babylonian and Assyrian, **176, 294, 295, 298;** Byzantine, **178–9, 552,** *pictures,* **1197, 182, 183;** Chinese, *pictures,* **747, 750;** Egyptian, **176, 178, 1100–6, 2939–40;** Gothic, **181–8, 662, 1198;** Greek, **177, 178, 180, 10–12;** India, **1755, 3429, 3431;** Italy (modern), **1843–52;** Mexico (anc.), *picture,* **289;** Mohammedan, **2278,** *picture,* **3298;** Renaissance, **188, 2996–7;** Roman (anc.), **177–9, 174, 3049–58;** Romanesque, **180–1, 2810,** *picture,* **2811;** Russian, *picture,* **3092;** S. American (anc.), **1741,** (modern), **3286.** For detailed references and lists of pictures *see Study Outline. Also see in Index* **Building construction; Cathedrals, famous; Houses.**
**Architrave** (*ăr'kĭ-trāv*), in architecture, *picture,* **180.**
**Arch of Augustus,** Rimini, *picture,* **1840.**
**Arch of Septimius Severus,** Rome, *picture,* **3053.**
**Arch of Titus,** Rome, **3055,** *picture,* **3051.**
**Archons** (*ăr'kŏnz*), elected officials of anc. Athens, **1521.**
**Arcis-sur-Aube** (*ăr-sē'-sür-ōb'*). Town in France 85 mi. e. of Paris where Allies defeated Napoleon 1814; birthplace of Danton.
**Arc light, 1123.**
**Arcole** (*ăr-kō'lā*). Village in n. Italy where Napoleon defeated Austrians, Nov. 17, 1796.
**Arcot** (*ăr-kŏt'*), **siege of, 796, 1753.**
**Arctic Circle, 189, 1969.**
**Arctic Ocean,** waters surrounding North Pole, **189;** coast, **226, 1191;** passage from Asia to n. Atlantic, **2862;** sea life and fisheries, **190, 2536, 3086.**
**Arctic regions, 189–90;** Asia, **226, 3228;** Eskimos, **1174–7;** Europe, **1191, 1962, 2534, 3085, 3086;** exploration, **2859–62;** geology, **1334;** Greenland, **1539–40;** mosquitoes, **2338;** N. Amer., **2515, 2528, 1948;** plant life, **3533, 2820, 2822;** reindeer, **2993;** "midnight sun," *picture,* **3394.** *See also in Index* **Polar exploration.**
**Arctic tern,** seasonal migration, **2231, 1549;** *picture,* **1551.**
**Arctu'rus,** the brightest star n. of the celestial equator, **3342.**
**Ardèche** (*ăr-dĕsh'*) **River,** in s. France, **3012.**
**Ar'den, Enoch.** Hero of Tennyson's poem 'Enoch Arden'; shipwrecked sailor who returning years later finds wife married again; leaves her untroubled and conceals his identity until death.
**Ar'den,** former forest in Warwickshire, England, **224.**
**Ardennes** (*ăr-dĕn'*), hilly wooded dist. in w. Europe; in France, **1344;** in Belgium, **376;** in Luxemburg, **2086.** Chief rivers Meuse and Sambre; much fighting during World War.
**Ard'more,** Okla., mfg. city in s.-cent. part of state with large oil, stock-raising, cotton, and asphalt interests; pop. 14,181; natural gas region; **2576.**
**Area,** in geometry, **1425.**
**Areca** (*ăr'ĕ-kȧ*), genus of tropical palms; betel-nut, **387.**
**Arena of Nimes,** one of the finest Rom. ruins in existence; 437 ft. long by 332 ft. wide; *picture,* **1342.**
**'Areopagitica'** (*ăr-ē-ŏp-ȧ-jĭt'ĭ-kȧ*), Milton's pamphlet on freedom of press, **2242, 1165.**
**Areopagus** (*ă-rē-ŏp'ȧ-gŭs*), **2154, 251.**
**Arequipa** (*ä-rā-kē'pä*), city, trade center in s. Peru, 100 mi. n.e. of port Mollendo; pop. 40,000; observatory of Harvard Univ. near by; mfrs., **2744.**
**Ares** (*ā'rēz*), in Gk. myth., god of war, **2154, 248;** statue (Villa Ludovisi), *picture,* **1530.**
**Aretinus, Guido.** *See in Index* **Guido Aretinus.**
**Arezzo** (*ä-rĕd'zō*), Italy. City 40 mi. s.e. of Florence; pop. 50,000; 13th cent. cathedral; art treasures; birthplace of Guido, Petrarch; anc. Arretium, one of 12 great cities of Etruria.
**Argali** (*ăr'gȧ-lē*), wild sheep of Mongolia, **3198–9.**
**Argand** (*ăr-gänd'*), **Aimé** (1755–1803), Swiss chemist, mathematician; invented Argand burner, **1958.**
**Argao** (*ăr-gä'ō*), P. I. Seaport on s.e. coast of Cebu Isl.; pop. 35,500.
**Argent,** in heraldry, **1639.**
**Argentina** (*ăr-jĕn-tē'nȧ*), republic in s.e. of S. Amer.; 1,153,119 sq. mi.; pop. about 9,000,000; **190–3,** *maps,* **3288, 191;** cap., Buenos Aires, **525–6;** climate, **3285, 2973;** cowboys (gauchos), *picture,* **3287;** pampas deer, **981;** foreign commerce, **526,**

**853, 891, 3591;** Patagonia, **2692;** railways, **526;** war with Uruguay, **3608;** wheat, **3732, 2973.**
**Arginusae** (*är-ĵi-nū'sē*). Three small isls. off w. coast of Asia Minor; Athenians defeated Spartans in naval battle 406 B.C.
**Argo** (*är'gō*), Ill., starch mfrs. of, **3344.**
**'Argo',** ship of the Argonauts, **193.**
**Argo,** constellation, *chart,* **3343.**
**Ar'gol,** a salt, **3438, 1502.**
**Ar'golis,** anc. Gk. dist. in n.e. Peloponnesus, *map,* **1518;** conquered by Argos, **1520.**
**Ar'gon,** a colorless gaseous element, **50;** in electric-light globes, **1123.**
**Argonaut** (*är'gō-nąt*), or "paper nautilus," **2280, 2418.**
**Argonauts,** in Gk. myth., **193;** Orpheus, **2602;** Theseus, **3487.**
**Argonne** (*är-ĝŏn'*) **Forest,** n.e. France; campaign in World War, **193–4, 3806, 3810.**
**Argos** (*är'ĝŏs*), Greece, anc. city 20 mi. s. of Corinth; great power in Peloponnesus; now small town; *map,* **27;** conquers Argolis, **1520;** Cretan influence, **28.**
**Argun' River,** rises in w. Manchuria, flows n. 1100 mi. on Siberian border to join Shilka and form Amur; **2135.**
**Argus** (*är'ĝŭs*), in Gk. myth., hundred-eyed giant, **1802;** markings of peacock, **2700.**
**Argus,** Odysseus' dog, **2565.**
**Argyll, John Douglas S. Campbell,** 9th **Duke of** (1845–1914). Gov.-gen. of Canada 1878–83; long known as Marquis of Lorne; married Princess Louise, daughter of Queen Victoria; Unionist leader and versatile writer.
**Aria** (*ä'rĭ-ä*), an elaborate solo in opera, **2584.**
**Ariadne** (*ă-rĭ-ăd'nē*), in Gk. myth., daughter of Minos, king of Crete; aids Theseus, **3487.** Deserted by him on Naxos, she was found and married by Dionysus.
**A'rianism,** the doctrine, repudiated by early Christian church as heresy, that the Son is finite and created by the Father; founded, **88;** Nicene Council, **763, 870;** Ostrogoths, **1491;** Pope Julius I, **1902;** Vandals, **3618.**
**Arica** (*ä-rē'kä*), seaport in n. Chile; pop. 6000; large trade with Bolivia; earthquake, **1065.**
**Ariel** (*ā'rĭ-ĕl*), fairy spirit in Shakespeare's 'Tempest', **3465.**
**Aries** (*ā'rĭ-ēz*) or **Ram,** sign of the zodiac, **3840.**
**Arion** (*ă-rī'ŏn*), in Gk. myth., poet-musician, **194.**
**Ariosto** (*ä-rē-ōs'tō*), **Lodovico** (1474–1533), Ital. epic poet, **1833.**
**Aristides** (*ăr-ĭs-tī'dēz*), "the Just" (d. 468? B.C.), Athenian general, **194–5,** *picture,* **1519.**
**Aristip'pus** (435?–356? B.C.), Gk. philosopher, pupil of Socrates, **3541.**
**Aristoc'racy** (govt.), in anc. Athens, **1521;** anc. Rome, **3042–4, 3046.**
**Aristogiton** (*ăr-ĭs-tō-ĵī'tŏn*), **1522.**
**Aristophanes** (*ăr-ĭs-tŏf'ă-nēz*) (448?–385 B.C.), Athenian comic dramatist, **1537, 1033.**
**Aristotle** (*ăr'ĭs-tŏt-l*) (384–322 B.C.), Gk. philosopher, **195–6, 1538;** and Alexander the Great, **86, 87;** classification of plants, **473;** falling bodies, **1508;** pupil of Plato, **2832;** on rhetoric, **3005;** accepts slavery, **3248;** defends torture, **2918;** as a zoölogist, **3841, 1208, 1089.**
**Arita** (*ä-rē'tä*), town in isl. of Kyushu, Japan; porcelain, **1874.**
**Arithmetic, 196–9;** addition, **18–24;** calculating machines, **571–2;** compared with algebra, **93;** decimals, **971–5;** division, **1015–7;** fractions, **1338–41;** history, **198;** modern methods of teaching, **198–9;** multiplication, **2366–8;** percentage and interest, **2724–6;** old puzzle-problems, **197;** Rom. and Arabic numerals, **2542–3;** subtraction, **3379–83;** Sumerian counting, **295;** value of, **196, 198.**
**Arius** (*ă-rī'ŭs*) (256–336), Alexandrian theologian, founder of Arianism, **88.**
**Arizona** (*ăr-ĭ-zō'nà*), state in s.w. U.S.; 113,956 sq. mi.; pop. 333,903; cap. Phoenix; **199–207,** *maps,* **201;** agriculture, **202, 1830, 3588, 904, 966;** animal life, **202, 2037, 591;** Devil's Canyon Bridge, *picture,* **2966;** Grand Canyon, **1495–7,** *picture,* **2402;** history, **202, 204, 2467, 3604, 1773;** Indians, **202, 793–4, 1767, 2933,** story, **204–7;** irrigation, **202, 1829, 1830;** minerals, **202, 225, 3590, 882;** meaning of name, **3347;** national parks, **2400, 200;** ostrich farming, **2603;** physical features, **199–200, 3580;** plant life, **202, 562;** state flower, **3347;** volcanic mts., **3658.**
**Arizona, University of.** Co-ed. state institution at Tucson, Ariz.; opened 1891 (established by legislature 1885); liberal arts, agriculture, engineering, commerce, home economics.
**Arkansas** (*är'kăn-są*), state in s.-cent. U.S.; 53,335 sq. mi.; pop. 1,752,204; cap. Little Rock; **207–8, 209;** *map,* **208;** history, **207–8, 857;** minerals, **207, 104, 1001–2;** origin of name, **3347, 207;** Ozark Mts., **2616, 207;** rice, **207, 3015;** state flower, **3347.**
**'Arkansas',** U. S. battleship, *picture,* **2656.**
**Arkansas, University of,** co-ed. state institution at Fayetteville, Ark.; founded 1871; arts and sciences, engineering, agriculture, education, music, art; Peabody Hall, *picture,* **209.**
**Arkan'sas City,** Kan. Farming and r.r. center in oil region near s. border, on Arkansas R.; pop. 11,253.
**Ar'kansas Indians, 207, 1964.**
**Ar'kansas River,** largest Mississippi affluent except Missouri; rises in Rocky Mts., flows s.e. 2000 mi.; *maps,* **1910, 2574, 208.**
**Arkose** (*är-kōs'*) **sand, 3123.**
**Ark'wright, Richard** (1732–92), inventor of the spinning frame, **208, 210, 652.**
**Arles** (*ärl*) (anc. Arelate), France, important town in Rom. times; cap. of kingdom of Arles, 10th cent.; remains of huge Rom. amphitheatre; pop. 17,000; varied mfrs.; on Rhone R., **3012.**
**Arlington,** Mass., town 7 mi. n.w. of Boston; pop. 18,665; **472.**
**Arlington,** Va., village on Potomac R.; govt. wireless station sends out time signals daily at noon; home of Gen. Lee, **1982, 1984;** national cemetery, **2902, 3686.**
**Arm,** bones of, *picture,* **3244;** muscles, *picture,* **2372;** how to bandage, **1267, 1268.**
**Arm, artificial, 3653.**
**Armada** (*är-mä'dä*), **Spanish** (1588), **210–1, 1137–8,** *picture,* **3301;** Drake, **1031;** results, **1153, 2763.**
**Armadil'lo, 211;** evolutionary position, *diagram,* **128;** foot, *picture,* **1323;** used as food, **836.**
**Armageddon** (*är-mà-ĝĕd'ŏn*), battlefield mentioned in Rev. xvi, 16, where final struggle between good and evil is to occur on Judgment Day; hence any great battle; **2645.**
**Ar'mature,** in electric motors, **1124, 1125;** part of dynamo, **1052;** *pictures,* **1051.**
**Armenia** (*är-mē'nĭ-ä*), a region in w. Asia; 140,000 sq. mi.; pop. 3,000,000; **211–3,** *map* **1196–7;** language, **224;** massacres, **1945, 213, 3558;** people resemble Hittites, **1669;** Rom. province, **1657;** wool spinners, *picture,* **3079;** in World War, **213, 3796, 1662.**
**Armenian church, 212–3, 2994;** Christmas, **758.**
**Armentières** (*är-mäń-tiār'*), Francc. Mfg. and border town on Lys R. 10 mi. s. of Ypres; in World War served as Allied anchor to s. flank of Ypres salient until captured by Germans April 11, 1918.
**Armin'ianism.** A doctrine of modified predestination, making salvation depend on acts of individuals; formulated by Jacob Arminius (Dutch, Harmensen) (1560–1609), anti-Calvinist theologian.
**Armin'ius** (17 B.C.–21 A.D.), Ger. chieftain, **1446.**
**Ar'mistice,** in World War, **213, 3808, 3748.**
**Armor, 214–6;** first used by Sumerians, **295;** heraldic devices, **1639;** medieval knights, **1933–5;** *pictures,* **297, 515, 1151, 1206, 1637.**
**Armor'ican tribes, 515.**
**Armor-piercing shell, 634.**
**Armor-plate,** of warships, **216, 2428;** armor-piercing shell, **634;** composition, **216, 2204;** first used, **2286–7, 2744;** U.S. mfrs. of, **427, 2813.**
**Armour** (*är'môr*), **Philip D.** (1832–1901). Chicago merchant and philanthropist; head of meat-packing firm and founder of Armour Institute of Technology, b. Stockbridge, N. Y.
**Armour Institute of Technology.** An institution for men at Chicago, Ill.; founded 1892; engineering and general science.
**Arms** (heraldry), **1639.**
**Arms** (weapons). *See in Index* **Cannon; Firearms; Weapons.**
**Arm'strong, Samuel Chapman** (1839–93). Amer. soldier and educator; b. Wailuku, Maui, Hawaii; founded (1868) Hampton Normal and Industrial Institute (Va.) for negroes and Indians.
**Army, 216–8;** airplanes, **58, 60;** balloons, **312–3, 314, 316,** *picture,* **317;** cannon, **633–6;** decorations of honor, **976–8;** firearms (rifles and pistols), **1252–7;** flags, **1287;** gas warfare, **1408;** machine guns, **2097–2101,** *picture,* **3798;** military engineering, **1149;** motor transport, **274–5,** *picture,* **276;** signaling, **3233;** tanks, **3433,** *picture,* **3794;** uniforms, **3575–9;** work of meteorologists, **3707–8.** *See also in Index* **Conscription; United States Army.**
**Army-worm, 218–9, 548.**
**'Ar'ne',** novel by Björnson, **432.**
**Arnhem** (*ärn'hĕm*), Netherlands, mfg. town on Rhine R. 50 mi. s.e. of Amsterdam; pop. 71,000; Groote Kerke; old town hall; **2441.**
**Ar'nica.** A genus of flowering plants of family *Compositae,* found in n. Europe and w. part of U.S.; tincture made from them a household remedy for sprains and bruises.
**Arno River,** Italy, rises in Apennines, flows 150 mi. to Mediterranean, through Florence, **1293, 1849, 1850,** Pisa, **2810.**
**Arnold, Benedict** (1741–1801), an Amer. soldier, **219–20, 123, 2238.**
**Arnold, Sir Edwin** (1832–1904). Eng. poet ('The Light of Asia').
**Arnold, Matthew** (1822–88), Eng. man of letters; grave austere poet ('Sohrab and Rustum'), brilliant essayist and critic ('Culture and Anarchy'); swept away old pompous, acridly personal school of literary criticism; **1167, 1178;** quoted, **3204.**
**Arnold, Thomas** (1795–1842). Father of Matthew Arnold; head master of Rugby, portrayed in Thomas Hughes' 'Tom Brown's School Days'; trained boys in character as well as scholarship.
**Arnold of Brescia** (*brĕsh'ä*) (1100?–55). Ital. priest and reformer; preached against vices and riches of clergy; led revolt against papal rule in Rome; executed at instigation of Adrian IV.
**Aromat'ic hydrocar'bons, 384.**
**Aroos'took,** county in Maine, **2126.**

**Aroostook,** r. in n. Maine, flows 125 mi. to St. John R., of which it is chief tributary, **2129.**
**Aroostook War,** boundary dispute between Maine and Canada, **2129, 3617;** Gen. Scott in, **3153.**
**Arpad** (d. 907). Founder of Arpad line which ruled Hungary until 1301.
**Arquebus** (*är'kwĕ-bŭs*), early handgun, **1252,** *picture,* **1253.**
**Ar'ran,** isl. noted for igneous rocks and beautiful scenery, **1625.**
**Arras** (*ä-räs'*), city in n. France; pop. 25,000; strategic point in World War; **220, 3805;** tapestry, **3434.**
**Arrhenius** (*ä-rā'nĭ-ŭs*), **Svante** (born 1859), Swedish chemist and physicist; originator of theory of electrolytic action; Nobel prize-winner (1903); advocate of theory that the energy of the world is self-renewing ('Worlds in the Making'); theory concerning planet Venus, **2817.**
**Arriaga** (*ăr-rē-ä'gȧ*), **Manoel de** (1842–1917). A leader in Port. rev. (1911) and first constitutional president of Portugal (1911–15).
**Arrin'di,** a silkworm of Bengal and Assam; larva and pupa, *pictures,* **661.**
**Arrow,** Amer. Indian types, *picture,* **1771;** Stone Age arrowheads, *picture,* **3361.** *See in Index* **Bow and arrow.**
**Arrowrock dam, 1829, 1725.**
**Arrowroot,** a kind of starch, **220.**
**Arroyo** (*ȧ-rōy'ō*), **2464.**
**Ar'senate of lead, 3331.**
**Arsenic** (*är'sĕn-ĭk*), a highly poisonous element, **220, 2855;** antidote, **1270;** found in cobalt ore, **816;** used in paint, **2642.**
**Art.** *See in Index* **Fine arts.**
**Artagnan** (*är-tä-nyäṅ'*), **Charles d',** Gascon adventurer, hero of Dumas' 'The Three Musketeers', 'Twenty Years After', 'Le Vicomte de Bragelonne'; **1048.**
**Artaxerxes** (*är-tăg-zĕrk'sēz*) **I.** King of Persia, son of Xerxes I, ruled 465–424 B.C.
**Artaxerxes II,** king of Persia 404–362 B.C., succeeding his father Darius II; life told by Plutarch; **1656.**
**Artaxerxes III,** king of Persia 362–338 B.C.; weak and despotic ruler; **1656.**
**Artemis** (*är'tĕ-mĭs*), in Gk. myth., goddess of the chase, **220–1, 1626;** Iphigenia, **3543;** Niobe, **2510;** Orion, **2601;** Pleiades, **2838;** statues, *pictures,* **1203, 1205;** temple at Ephesus, **3178,** *picture,* **3179.**
**Artemisia** (*är-tĕ-mĭsh'ĭ-ȧ*), queen of Halicarnassus; Mausoleum, **3178.**
**Artemisia,** genus of plants of family *Compositae;* includes sage, **3104.**
**Artemisium** (*är-tĕ-mĭsh'ĭ-ŭm*), cap. of n. coast of Euboea, isl. in Aegean Sea; naval victory of Greeks over Persians 480 B.C., **2740.**
**Arte'rial blood, 438.**
**Ar'teries,** blood-vessels which carry blood from heart to body tissues, **1615, 438;** aorta, **1617,** *picture,* **1616;** bleeding, how to stop, **1270;** hepatic, **2031;** pulmonary, **1616,** *pictures,* **2083, 1616;** pulse, **2933, 1615.**
**Arte'sian wells, 221–2, 3331;** used for irrigation, **264, 2466, 97.**
**Artevelde** (*är-tĕ-vĕl'dĕ*), **Jacob Van** (1290?–1345), Flemish leader in revolt of Ghent (1337) against Count of Flanders, **1456.** His son Philip (1340–82) was killed in similar revolt.
**Ar'thropods,** the phylum of animals with jointed legs, **127, 1787, 3325,** *Study Outline,* **3945–7.**
**Arthur,** king of Britain, in 6th cent.; hero of many legends; founder of the Order of the Round Table; **223, 3664.**
**Arthur** (1187–1203), duke of Brittany, **1896.**
**Arthur, Chester Alan** (1830–86), 21st president of U. S., **222–3;** nominated for vice-presidency, **1399;** civil service reform, **223, 776.**
**Arthurian legends, 223, 3068, 3039;** Galahad, **1391;** Lohengrin, **2047;** popularized by Geoffrey of Monmouth, **1163,** by Malory, **1164,** by Tennyson, **1167, 3472;** stories: 'How Arthur Won His Crown', **223–4;** 'The Ninth Diamond', **3069–70;** 'The Kitchen Boy Who Became a Knight', **3070.**
**Ar'tichoke.** A tall thistle-like plant (*Cynara scolymus*) of the aster family; cultivated for the thickened outer scales and receptacles of the flower heads, which are edible when immature; native of Mediterranean region, extensively cultivated in California.
**Articles of Confederation,** U. S., **3593, 3347, 3602;** Md. withholds ratification, **2528.**
**Artificial substances:** camphor, **594;** gems, **1410, 1002;** leather, **1977, 673;** perfumes, **2729;** silk, **3240, 673.**
**Artigas** (*är-tē'gäs*), **Fernando José** (1764–1850). Founder of Uruguayan nationality, who aided Argentina, then including Uruguay, against Spain; expelled Argentine forces 1815, becoming virtual dictator; was overthrown by Portuguese from Brazil 1820; died in exile.
**Artillery, 216–7, 633–6;** early use, **1700, 2979;** uniform insignia (U. S.), **3578,** *picture,* **3576;** in World War, **3791,** *pictures,* **3789, 3793, 633, 635, 3805.**
**Artois** (*är-twä'*), former province in n. France, cap. Arras; now department of Pas-de-Calais; desperate fighting in World War (Cambrai, Loos, Neuve Chapelle); gives name to artesian well, **221.**
**Aru** (*ä-rų'*) or **Arru Islands,** group in Dutch E. Indies s.w. of New Guinea; pop. 22,000, *map,* **1073;** pearls, **2703.**
**Aruwimi** (*ä-rų-wē'mē*) **River,** tributary to Congo; rises w. of Albert Nyanza, flows w. 800 mi. through jungles of equatorial Africa; partly explored by Stanley (1887); *map,* **859.**
**Aryan** (*är'yăn*), **224, 2771, 1752.** *See also in Index* **Indo-European.**
**Asa** (*ā'sȧ*). Third king of Judah, zealous uprooter of idolatry (I Kings xv; II Chron. xiv-xvi).
**Asafoetida** (*ăs-ȧ-fĕt'ĭ-dȧ*), a resin, **2997;** use, **1042.**
**Asaph** (*ā'săf*). Leader of David's temple choir. The hereditary choirs of the temple were called "sons of Asaph" (I Chron. xxv).
**Asbestos** (*ăs-bĕs'tŏs*), a fibrous mineral used in fireproof fabrics, **225;** production in Canada, **610, 2945,** in Pa., **2720.**
**Asbury** (*ăz'bûr-ĭ*), **Francis** (1745–1816), first Meth. Episc. bishop in U. S., **3396.**
**Asbury Park,** N. J., resort on Atlantic coast 50 mi. s. of New York City; pop. 12,400; **2458.**
**Ascalon** (*ăs'kȧ-lŏn*) or **Askelon,** anc. Philistine city on the Mediterranean; center of Hellenistic culture; birthplace of Herod the Great; scene of battles in Crusades; **2770.**
**Ascalon,** magic sword of St. George, **1027.**
**Ascension** (*ă-sĕn'shŏn*), isolated Brit. isl. near middle of S. Atlantic Ocean; 34 sq. mi.; govt. sanatorium; noted for large turtles; **254,** *map,* **255.**
**Ascham** (*ăs'kȧm*), **Roger** (1515?–68). Eng. classical scholar and writer; tutor of Queen Elizabeth; noted for defense of gentle methods of teaching ('The Scholemaster').
**Ascolichenes** (*ăs-kŏ-lī-kē'nēz*), plant group including most of the lichens, **3938.**
**Ascoli Piceno** (*ăs'kō-lē pē-chā'nō*). Latin Asculum, Italy, town 90 mi. n.e. of Rome; pop. 32,000; old Rom. bridges, historic buildings.
**Ascomycetes** (*ăs-kō-mī-sē'tēz*), a class of fungi, **1382, 3938;** true mildews, **2236;** morel, mushrooms, and truffles, **2375.**
**As'culum, battle of, 2941.**
**Ascut'ney, Mt.** ("Three Brothers"), in Vt., 3300 ft. high; granite **3633.**
**Asep'sis, 150, 2193.**
**Asexual spores, 3173.**
**Asgard** (*ăs'gärd*), in Norse myth., home of gods, **2560, 306, 3135.**
**Ash,** a hardwood tree, **225;** mountain, **2357, 3533;** prickly, **3533;** winged seed, **3172.**
**Ash,** or mineral salts; cigar, **715;** in food, **1320, 2239;** potash, **2898–2900;** seaweed, **3171;** volcanic, **3657, 3658;** industrial uses, **2430.**
**Ashanti** (*ȧ-shăn'tĭ*), inland territory in Brit. Gold Coast colony, W. Africa; until 1901 negro kingdom; cap. Coomassie; **33.**
**Ash'burton, Alexander Baring, Baron** (1774–1848), Eng. diplomat and financier, member of great Baring banking house; negotiates Webster-Ashburton treaty, **3571, 2129.**
**'Ashby, The Tournament of',** story, **3152–3.**
**Ash'dod,** anc. Philistine city, **2770.**
**Asher** (*ăsh'ẽr*) (Hebrew "blessed"). Son of Jacob; ancestor of tribe of Asher.
**Ashe'ville,** N. C., in Blue Ridge Mts.; pop. 28,504; many schools; stock-raising and dairying region; Biltmore, G. W. Vanderbilt estate near by; govt. forest preserves (130,000 acres); **2520;** hotel, *picture,* **2521.**
**Ashland,** Ky. Mfg. and mining city on Ohio R. near n.e. border; pop. 14,729; iron and steel goods; shipping point for iron ore, coke, coal, and lumber.
**Ashland,** Va. Town 15 mi. n. of Richmond; pop. 1300; Randolph-Macon College; Henry Clay's birthplace 6 mi. away.
**Ashland,** Wis., city 57 mi. e. of Superior, on inlet of L. Superior; pop. 11,334; shipping center for lumber, coal, and hematite iron ore from Gogebic range; lumber, paper mfrs.; Allouez mission, **3772.**
**Ash'ley River,** in S. C., **699, 3292.**
**Ashokan** (*ă-shō'kăn*) **Reservoir, 3701,** *pictures,* **2486, 3701.**
**Ash soil, 3273.**
**Ashtabu'la,** Ohio, on L. Erie, 53 mi. n.e. of Cleveland; pop. 22,082; port and iron ore; various mfrs., **2570.**
**Ash'ton, Lucy.** Heroine of Scott's 'Bride of Lammermoor'; betrothed to Ravenswood but forced to marry another; stabs her husband on wedding night and goes mad; story used by Donizetti in opera 'Lucia di Lammermoor'.
**Ashtoreth.** Same as **Astarte.**
**Ashurbanipal.** Same as **Assurbanipal.**
**Ash Wednesday,** first day of Lent, **1070.**
**Asia** (*ā'shȧ*), largest of the continents; 17,250,000 sq. mi.; pop. 900,000,000; **226–34,** *maps,* **232–3;** *Study Outline,* **3919–26;** animals, **230;** climate, **226–7, 230, 3751;** deserts, **228, 3104;** elevation, **226, 2791,** *map* facing **232;** former land connection with Africa, **2106;** history, **232–3,** Marco Polo's travels, **2874;** mountains and plateaus, **226, 227;** oil fields, **2755;** population, **226, 228, 2880–1,** *map* facing **232;** railroads, **2963;** rainfall, **227, 230,** *map* facing **232;** religions, **232, 2993–4;** rivers, **230;** steppes, **230;** tundras, **226;** vegetation, **226, 228, 230,** *map* facing **232.** *See also in Index* under names of chief physical features, political divisions, and cities.
**Asia'go.** Ital. town 50 mi. n.w. of Venice; center of small plateau district s.e. of former Austrian Trentino; scene of Austrian offen-

sive, May 14–June 18, 1916; ground recovered in several actions, notably in Nov.–Dec., 1917, after battle of Caporetto.
**Asia Minor** or **Anatolia,** peninsula of Asia between Black Sea and Mediterranean; **234, 3557–8,** *maps,* **1196–7, 27;** importance of Smyrna, **3255;** steppes, **230;** wheat, **48.**—*History:* Aegean civilization, **27–9;** Hittites, **1669;** Lydian empire, **923;** Gk. colonies, **1520, 2738, 86;** Rome conquers, **3046;** Mongols, **2285–6, 3559;** Turks, **552;** Gk. gains after World War, **1526.**
**Asiat'ic elephant, 1126.**
**Asiatic** or **Mongolian race, 2956.**
**Asir** (*ä-sēr'*), principate in Arabia, **167,** *map,* **232–3.**
**Asmodeus** (*ăs-mō-dē'ŭs*). In Jewish tradition (Book of Tobit), king of demons; slew husbands of Sara until exorcised by Tobias.
**Asoka** (*à-sō'kà*). Emperor of India 264–228? B.C.; great conqueror, most powerful sovereign of his time, who, becoming horrified by evils of war, devoted himself to spreading Buddhist religion. He conducted a remarkable missionary campaign and strewed the country with inscriptions setting forth Buddhist doctrines. "If a man's fame can be measured by the number of hearts who revere his memory . . . . Asoka is more famous than Charlemagne or Caesar."
**Asp,** or African cobra, **817.**
**Aspar'agus,** a plant, **234;** belongs to lily family, **2009;** blanching, **2828;** when and how to plant, **1397.**
**Aspasia** (*ăs-pā'shĭ-à*) (5th cent. B.C.). Beautiful intellectual Gk. woman, b. Miletus; lived as wife with Pericles, whom she greatly influenced.
**As'pen,** or trembling poplar, 2880, *picture,* **2879.**
**Aspern** (*äs'pĕrn*), Austria. Village on Danube R. opposite Vienna; Napoleon defeated (1809).
**Asphalt** (*ăs'fâlt*), **234–5;** artificial, **2754;** found in Calif., **235, 1336,** Cuba, **235, 937,** Trinidad, **3541, 234,** Turkestan, **3556,** Venezuela, **3622;** used in paving, **3026.**
**Asphodel** (*ăs'fō-dĕl*), plant genus of lily family; in Gk. legend, most famous of all plants associated with underworld; **1518.**
**Asphyxia'tion,** caused by carbon dioxide, **642.**
**Asquith** (*ăs'kwĭth*), **Herbert Henry** (born 1852), Eng. statesman, Liberal; prime minister 1908–16; **1811, 2039, 2040.**
**Ass, 235–6;** first domesticated, **3524.**
**Assam** (*ă-săm'*), province in e. Brit. India, bordering China and Burma; 53,000 sq. mi.; pop. 6,715,000; jungles; rice, tea, silk, cotton; *maps,* **1745, 232–3;** animals, **1748;** wettest region in world, **230, 1747.**
**Assas'sins,** Mohammedan sect, **236.**
**Assay'ing,** in metallurgy, **236, 2258.**
**Assegai** (*ăs'ē-gī*), a spear, **3280.**
**Assembly, National,** France, **1179, 1367–8.**
**Assignats** (*ăs'ĭg-năts*), Fr. paper money, **2282, 1368.**
**Assiniboia** (*ăs-ĭ-nĭ-boi'à*). Former dist. of Northwest Territories, Canada; now part of Alberta and Saskatchewan.
**Assin'iboins** ("stone-boilers"), tribe of Plains Indians formerly ranging from Missouri to Saskatchewan rivers, **1767.**
**Assiniboine** (*ă-sĭn'ĭ-boin*) **River,** in s. Saskatchewan and Manitoba, Canada; flows 450 mi. s.e.; **604, 3752.**
**Assisi** (*ăs-sē'sē*), town in cent. Italy; pop. 20,000; birthplace of St. Francis, **1355;** Giotto's paintings, **1461.**
**Assiut** (*às-sē-ŭt'*) or **Siut,** Egypt, city near w. bank of Nile, 248 mi. s. of Cairo; pop. 52,000; once starting point of caravan route into Libyan desert and Sudan; **1094.**
**Associated Press, 2475.**
**Association of ideas, 2930.**
**Assuan** (*ăs-ụ-ăn'*), anc. Syene, town and resort in upper Egypt on Nile R.; pop. 12,000; near fine ruins; great Nile dam, **2510, 1094, 568–9, 1828,** spillway, *picture,* **1096.**
**Assumption of state debts** (U. S.), **1569, 3677–8, 3680.**
**'Assumption of the Madonna',** by Titian, *picture,* **3505.**
**Assur** (*ăs'ûr*), original name of Assyria and earliest cap. on Tigris R.; destroyed by Medes and Chaldeans 606 B.C.; **297.**
**Assurbanipal** (*ăs-ûr-bä'nĭ-päl*) or **Ashurbanipal,** last great Assyrian emperor (7th cent. B.C.); called Sardanapalus by Greeks; extent of empire, *map,* **298;** palace and library excavated, **2510, 1992,** *pictures,* **296, 297.**
**Assyrian Empire, 297–8;** architecture, **176,** *picture,* **295;** enameling, **1145;** iron weapons, **1817;** language, **1624;** library of Assurbanipal, **1992;** Nineveh, cap., **2510;** sculpture, **3155–6,** *pictures,* **296, 297, 1206, 3155;** slavery, **3248;** wood engraving, **1168.** —*History:* Israel conquered, **1890;** Hittite empire conquered, **1669;** Egypt subdued, **1106;** Medes overthrow, **2510, 2191.** *See also in Index* **Babylonia and Assyria.**
**Astarte** (*ăs-tär'tē*) or **Ash'toreth,** Phoenician goddess, **2774.** Corresponds to Gk. Aphrodite.
**Aster** (*ăs'tẽr*), perennial flowering plant, **236–7.**
**Aster family** or *Asteraceae,* the highest family of plants, **3943, 237.**
**Asteroi'dea,** starfish class of echinoderms, **3945.**
**As'teroids,** small planets, **237, 2815–6,** typified by Eros, *picture,* **238;** zone, *chart,* **2816.**
**Astig'matism,** a defect of vision, **1214;** corrected by lenses, **3310, 1987.**
**As'ton Manor,** England. Industrial center just n. of Birmingham; pop. 75,000; beer, paper, motor vehicles.
**Astor, John Jacob** (1763–1848), Amer. merchant, b. Germany; gained largest Amer. fortune up to that time ($30,000,000) through fur trade, shipping, and real estate investments on Manhattan Isl.; Astoria, **2597.**
**Astor, Nancy Langhorne, Lady** (born 1879), b. Greenwood, Va., U.S.A.; member of Brit. Parliament, **3779.**
**Asto'ria,** Ore., at mouth of Columbia R.; pop. 14,027; largest salmon cannery of about 50 in vicinity; shipyards; originally fur-trading station, **2597.**
**Astrabad',** Persia, at foot of Elburz Mts.; estimated pop. 10,000; Caspian port, **654.**
**Astrakhan** (*ăs-trà-kăn'*), Russia, pop. 165,000; chief port on Caspian Sea, **237, 654; 3660;** also Rus. province, 91,042 sq. mi.; pop. 1,500,000, **3084.**
**Astrakhan,** a breed of sheep, **3200;** fur, **237, 1390.**
**Astrin'gent drugs,** defined, **1042;** alum, **104.**
**As'trolabe, 2422.**
**Astrol'ogy,** the forerunner of astronomy, **3840, 2815, 240.**
**Astronom'ical telescope,** one showing an inverted image, **3463.**
**Astron'omy, 238–47,** *Study Outline,* **4045-4047;** asteroids, **237,** *picture,* **238;** comets, **849–52;** constellations, **872,** *pictures,* **873, 3343;** earth, **1058–64;** eclipses, **1074–5;** equinoxes and solstices, **1173;** gravitation, **1506–9;** how gravity deflects light, *picture,* **1999;** meteors and meteorites, **2202–4;** moon, **2318–23;** nebulae, **2432–3;** observatory, **2551–2;** planets, **2815–9;** spectroscopes, **3311–4;** stars, **3340–4;** sun and solar system, **3392–5;** telescopes, **3462–3;** used in navigation, **2420;** in surveying, **3398,** in time determinations, **3500, 3684;** zodiac, **3840.** —*History,* **239–40;** Aztec knowledge, **290;** Chaldean progress, **298;** Copernicus, **880–1;** Galileo, **1391–2;** Kepler, **1920–1;** Neptune discovered, **244–7;** Newton's theory of gravitation, **2476, 2478;** Ptolemy, **2931–2;** Pythagoreans, **2942.** *See also in Index* chief topics named above.
**Astu'rias,** anc. province of n.w. Spain, nucleus of Span. kingdom, **1195, 3304,** *map,* **3300.**
**Astyages** (*ăs-tī'à-ġēz*), Median king; reigned 584–550 B.C.; **2191.**
**Astyanax** (*ăs-tī'à-năks*), in Gk. myth., son of Hector, **1626.**
**Asunción** (*ä-sụn-sī-ōn'*), Paraguay, cap., on Paraguay R.; pop. 100,000; trade in Paraguay tea, tobacco, fruits, etc.; **2677,** *picture,* **2676.**
**'As You Like It',** comedy by Shakespeare, **224–5;** quotations from, **3192.**
**Atacama** (*ä-tä-kä'mä*), **Desert of,** large elevated tract in n. Chile, barren, but rich in minerals; nitrates, **736.**
**Atahualpa** (*ä-tä-hwäl'pä*) (d. 1533), last Inca of Peru, **2814.**
**Atalanta** (*ăt-à-lăn'tà*), in Gk. myth., a maiden famous for beauty and fleetness, **247–8.**
**Atbara** (*ät-bä'rä*) **River,** rises in n. Abyssinia and flows n.w. 500 mi. to Nile, **2510.**
**Atch'ison,** Kan. A city on "Great Bend" of Missouri R.; pop. 12,630; flour mills, wholesale grocery and hardware houses; trade in farm products.
**Atchison, Topeka & Santa Fe Ry.,** completed, **223;** Devil's Canyon (Ariz.) bridge, *picture,* **2966;** route, **2963, 2466.**
**Athabas'cans** or **Athapascans,** linguistic stock of N. Amer. Indians centered about Yukon and Mackenzie rivers but extending s. to Mexico, **1767.**
**Athabaska** or **Athabasca,** lake in n. Alberta and Saskatchewan, Canada; 2850 sq. mi.; **2102, 3128.**
**Athabaska River,** in Alberta, Canada; flows 800 mi. n.e. to Athabaska L.; **2102, 604;** "tar" sands, **82.**
**Athaliah** (*ăth-à-lī'à*). Daughter of Ahab and wife of Jehoram; slaughtered grandsons except one, and seized power; was put to death six years later on coronation of Joash, the heir who had been kept in hiding (II Kings xi); subject of Racine's tragedy 'Athalie'.
**Athanasius** (*ăth-à-nā'shŭs*), **Saint** (296–373), bishop of Alexandria, chief defender of orthodox doctrine of Trinity against Arianism. **88;** Nicene council, **870;** converts Abyssinia, **3.**
**Ath'elstan** or **Aethelstan** (895–940). Saxon king, succeeded 924; grandson of Alfred the Great; first Saxon king to be called king of all Britain; defeated Celts and Danes at Brunanburgh (937).
**Athena** (*à-thē'nà*), in Gk. myth., goddess of wisdom, **248–9;** Achilles, **1627;** Acropolis temple, **11–12;** aegis, **3839;** Cadmus, **563;** Gorgon's head, **2732;** Odysseus, **2563;** olive tree, **249;** Paris, judgment of, **3542;** statues by Phidias, **11, 12, 2760,** *picture,* **248.**
**Ath'ens,** Ga., cotton trading and mfg. city 64 mi. e. of Atlanta; pop. 16,748; state univ., *picture,* **1433.**
**Athens,** cap. of Greece; pop. (with Piraeus) 300,000; **249–51;** Acropolis, **10–12,** *pictures,* **1516, 1517, 1527;** theater of Dionysus, **3482.** —*History,* **251;** legend of Theseus, **3487;** rise of democracy, **1521–2;** reforms of Solon, **3274–5, 3655;** in Persian Wars, **2738–40, 195;** under Themistocles, **1522;** age of Pericles, **1522, 1524, 2729–30, 2760;** Peloponnesian

Wars, **1524, 3310;** Macedonian conquest, **1525, 993, 3486.** *See also in Index* **Greece; Greek art.**

**Athens,** Ohio. City 75 mi. s.w. of Columbus; pop. 6418; Ohio Univ., coal-mining center with lumber and brick plants.

**Atherton, Gertrude** (born 1857). Amer. novelist, b. San Francisco ('The Conqueror'; 'The White Morning'; 'The Avalanche').

**Athlet'ics, 251–3;** 'The Honor of the Playing Field', a Little Talk by Arthur Mee, **253;** baseball, **338–41;** basketball, **343–5;** boxing, **476–7;** college, **2610, 831, 833;** cricket, **919–21;** curling, **940,** *picture,* **3755;** football, **1324–7;** golf, **1484–7;** hockey, **1669–70;** influence on Gk. art, **1529;** lacrosse, **1954–5;** polo, **2873;** rowing, **444,** *pictures,* **445, 833;** skating, **3753;** skiing, **3754;** swimming, **3410–2;** tennis, **3469–71;** wrestling, **3815.**

**Athlone** (*ăth'lōn*), Ireland. Town on Shannon R. 70 mi. w. of Dublin; pop. 10,000; important military point; taken by James II in 1690.

**Athor** (*ā'thôr*) or **Hathor.** An Egypt. goddess, sometimes identified with Isis and with Gk. Aphrodite; usually represented with cow's head or horns.

**Athos** (*ăth'ŏs*), one of the "Three Musketeers" in Dumas' novel, **1048.**

**Athos,** peninsula, n.e. Greece; contains Mt. Athos (6350 ft.); site of many monasteries, **1528, 2298;** Persian fleet destroyed, **2739.**

**Atlan'ta,** Ga., cap. and largest city; pop. 200,616; **254,** *pictures,* **1433, 1434;** taken by Sherman, **3206.**

**Atlantic City,** N. J., popular seaside resort; pop. 50,707; **254.**

**Atlantic Fisheries Dispute,** arising from attempt of Gt. Brit. to exclude U.S. from fisheries off Canadian coast after Rev. War, complicating Anglo-Amer. relations for over a century, **2450, 172.** Finally settled by award of Hague Tribunal in 1910.

**Atlantic Ocean,** 2d largest of the oceans, **254–6, 2553–4;** cables, **561;** currents, **1549, 1948, 2558–9;** first free use by ships, **3208, 853;** fisheries, **1282, 1283, 2450;** icebergs, **1721–2;** Sargasso Sea, **3170;** winds, **3750,** *picture,* **3751.**

**Atlan'tis,** fabled isl., **256, 2553.**

**At'las,** in Gk. myth., rebellious Titan, brother of Prometheus; condemned to bear heavens on his shoulder; often pictured in early collections of maps; name hence applied to such works; **1640, 2732, 2838.**

**Atlas Mts.,** double range in n.w. Africa, **33;** in Algeria, **97;** Morocco, **2328;** Tunis, **3549.**

**Atmosphere.** *See in Index* **Air; Meteorology.**

**Atoll** (*ȧ-tŏl'*), a coral islet, **886, 2621,** *picture,* **2789.**

**Atom** (*ăt'ȯm*), smallest or "unit" particle of a chemical element, **256–7, 714, 4039;** atomic theory formulated by John Dalton, **2174;** composed of electrons, **1112,** *picture,* **1111;** in electric cell, *picture,* **1109;** once supposed indestructible, **2787;** radioactivity establishes new view, **2959, 2787;** spectrums, **3311.**

**Atom'ic weight,** relative weight of the atom of a given element, **4039, 2174;** table, **4042.**

**Atox'yl,** a remedy for sleeping sickness, **3547.**

**Atrato** (*ä-trä'tō*) **River,** in w. Colombia, **836,** *map,* **835.**

**Atreus** (*ā'trụs*). In Gk. myth., father of the Atridae, Agamemnon, and Menelaus; slew children of his brother Thyestes and served them to him as food, thus drawing down curse on his race.

**Atrium** (*ā'trĭ-ŭm*), of Pompeian house, *picture,* **2876.**

**At'ropine,** a poisonous alkaloid, **10, 2509, 2855.**

**Atropos** (*ăt'rō-pŏs*), in Gk. myth., the eldest Fate, who cuts the thread of life, **1225.**

**Attar** (*ăt'ȧr*) **of roses, 2728, 3066;** Bulgaria, **533;** Cashmere, **653;** Egypt, **1097;** Persia, **2734.**

**Attention,** in psychology, **2197.**

**Attica** (*ăt'ĭ-kȧ*), anc. division of e.-cent. Greece on Aegean Sea, *map,* **1518;** Athens, ruling city, **1520;** inhabitants today, **1528;** mountains, **249;** Peloponnesian War, **1524;** silver mines, **3242, 1522, 1527.** *See also in Index* **Athens.**

**Attic dialect, 1538.**

**At'tila** (d. 453), king of the Huns, known as "the scourge of God," **1704, 763;** in Ger. myth., **2504.**

**At'tleboro,** Mass. City near e. boundary of R. I.; pop. 19,731; jewelry, silverware, electro-plate, cotton machinery, steel products; bleacheries, dye-houses, cotton mills.

**Attorney-General,** U.S., **3601, 555, 3596.**

**Attraction,** chemical, **712;** in plants, **2828.**

**Attraction,** electrical, **1108, 1110,** *picture,* **1112;** first analyzed by du Fay, **1117–8;** laws discovered by Cavendish, **1118, 1120.**

**Attraction** (gravitation), **1506–9.**

**Aube** (*ōb*), r. of n.e. France, 150 mi. long, **3173.**

**Auber** (*ō-bêr'*), **Daniel F. E.** (1782–1871). Fr. musical composer, regarded as founder of Fr. grand opera ('The Dumb Girl of Portici'; 'Fra Diavolo').

**Auburn,** Ala., town 51 mi. n.e. of Montgomery; pop. 2143; **73.**

**Auburn,** Me. City 30 mi. n. of Portland on w. bank of Androscoggin R., opposite Lewiston; pop. 16,985; shoe mfrs. among largest in U.S.

**Auburn,** N.Y. City in lake region in w. N.Y., 25 mi. s.w. of Syracuse; pop. 36,192; popular summer resort; cordage, farm implements, shoes, carpets; Presb. theological seminary; state prison.

**Auckland** (*ąk'lȧnd*), largest city of New Zealand, on n.e. coast of North Isl.; pop. 145,000; **2500.**

**Auckland Islands,** uninhabited group 200 mi. s. of New Zealand; largest isl. 330 sq. mi.; station for shipwrecked sailors maintained by N. Z. govt.; **2500.**

**Audion** (*ą'dĭ-ŏn*), **257, 3762,** *pictures,* **3759, 3761, 1799.**

**Auditory nerve, 1057.**

**Audubon** (*ȧ'dụ-bŏn*), **John James** (1780–1851). Amer. naturalist and artist ('The Birds of America'), **426.**

**Auerbach** (*ou'ĕr-bäĸ*), **Berthold** (1812–82), Ger. novelist ('On the Heights'; 'Black Forest Village Stories'); **1892.**

**Auerstädt** (*ou'ĕr-shtĕt*), Germany. Village in Saxony 15 mi. n. of Weimar; French defeated Prussians 1806.

**Augean** (*ą-ǧē'ȧn*) **stables,** in Gk. myth., **1640.**

**Au'ger shell,** *picture,* **3203.**

**Augite** (*ą'ǧīt*), crystal, *picture,* **935.**

**Augsburg** (*ouĝz'bụrĸ*), Germany, mfg. city on Leck R. 35 mi. n.w. of Munich; pop. 155,000; textiles; founded 14 B.C.; **1442, 347;** in Thirty Years' War, **3488–9.**

**Augsburg, Peace of,** religious agreement of 1555, **2988, 691.**

**Augsburg Confession,** standard of Lutheran faith, **2988.**

**Augurs** (*ą'gûr*). In anc. Rome, members of a religious college whose duty it was to interpret the signs (*auspices*) of approval or disapproval sent by the gods in reference to any proposed undertaking; these signs were found in the sky (as thunder and lightning), in flight and feeding of birds, condition of entrails of animals sacrificed, etc.

**August,** the 8th month, **257;** birthday stone, **1409.**

**Augus'ta,** Ga., cotton mfg. city and cotton market in n.e. on Savannah R.; pop. 52,548; state univ. medical college; twice taken by British during Rev. War; Confederate powder works; **1432.**

**Augusta,** Me., state cap. on Kennebec R. 40 mi. from sea with good shipping facilities; pop. 14,114; mfg. city and trading point for large territory; **2126;** capitol, *picture,* **2127.**

**Augustan'a College and Theological Seminary.** At Rock Island, Ill.; founded 1860; theology, collegiate work, business, music and art; Lutheran, co-ed.

**Augus'tan Age,** in Latin literature, **1967, 258.** Term also sometimes applied to reign of Queen Anne, as epoch of great literary achievement.

**Augusta Taurino'rum** (now **Turin**), **3555.**

**Augustine** (*ą'ǧŭs-tēn*), **Saint** (354–430), bishop of Hippo, greatest of Church Fathers; profoundly influenced both Catholicism and Protestantism ('Confessions'; 'The City of God'); **764.**

**Augustine, Saint** (d. 613), apostle to England, sent in 597 by Pope Gregory I; first archbishop of Canterbury; **636, 1152.**

**Augustin'ian friars, 2300, 2302;** Luther joins, **2085.**

**Augus'tus** (63 B.C.–14 A.D.), emperor of Rome, **257–8, 3046;** changes calendar, **257;** happy married life, **2152;** statue, **3054,** *pictures,* **1200, 1532, 3043.**

**Augustus, Arch of** (Rimini), *picture,* **1840.**

**Auk** (*ąk*), a sea bird, **258–9, 1090.**

**Auld Lang Syne** (Scotch, "old long since"). A Scotch popular song; words written by Robert Burns; probably set to music by George Thomson 1799.

**Au'lis,** port of anc. Boeotia, **3543.**

**Aure'lia,** a jelly-fish, *pictures,* **1884.**

**Aurelian** (*ą-rē'lĭ-ȧn*) (d. 275), one of greatest Rom. soldier emperors (270–275); "restorer of the empire"; conquers Palmyra, **2648.**

**Aure'lius, Marcus.** *See in Index* **Marcus Aurelius Antoninus.**

**Au'ricle,** of heart, **1616.**

**Auriga** (*ą-rī'ǧȧ*) or **Charioteer,** a constellation, **872,** *charts,* **873, 3343.**

**Aurochs** (*ą'rŏks*), European bison, **431.**

**Auro'ra,** in Rom. myth., goddess of dawn, **259.**

**Aurora,** Ill. City on Fox R. 36 mi. w. of Chicago; pop. 36,397; shops of C. B. & Q. R.R., machine shops, flour and woolen mills, stove and iron works.

**Aurora,** N.Y. Town and summer resort on Cayuga L. 25 mi. n. of Ithaca; pop. 416; Wells College for women.

**Aurora Borealis** (*bō-rē-ā'lĭs*), **259,** *picture,* **260.**

**'Aurora Leigh',** poem by Elizabeth Barrett Browning, **516.**

**Aurungzebe** (*ą-rŭng-zāb'*) or **Aurungzeb** (1618–1707), last powerful Mogul emperor of India, **1752, 2286.**

**Ausable** (*ą-sā'bl*) **River,** N.Y., small rapid stream flowing into L. Champlain; lower course through a picturesque gorge; *picture,* **2481.**

**Aussig** (*ou'sĭĸ*) or **Usti,** Czecho-Slovakia, city in Bohemia on Elbe R. 45 mi. n.w. of Prague; pop. 39,000; coal traffic; chemicals; **1107.**

**Austen, Jane** (1775–1817), Eng. novelist, unequaled in "the exquisite touch that makes commonplace things and characters interesting" ('Pride and Prejudice'; 'Emma'; 'Mansfield Park'); **2540, 1167.**

**Austerlitz** (*ąs'tĕr-lĭtz*), Czecho-Slovakia, village 12 mi. s.e. of Brünn; battle of (1805), **2394, 2395.**

**Austin, Alfred** (1835–1913), Eng. poet laureate (1896–1913), **2848.**
**Austin, Stephen Fuller** (1793–1836), "the Father of Texas," **261, 3478.**
**Austin,** Minn. City on Red Cedar R. 11 mi. n. of Iowa border; pop. 10,118; trade center of agricultural region.
**Austin,** Tex., cap. on Colorado R. 72 mi. n.e. of San Antonio; pop. 34,876; r.r. and farming trade center; canneries, oil mills, planing mills; large dam; **3477, 3478;** named for Stephen Austin, **261;** state capitol, *picture,* **3476;** U. of Texas, *picture,* **3477.**
**Aus'tral Islands.** Same as **Tubuai.**
**Australasia** (*ȧs-trȧl-ā'shȧ*), all the isls. of the S. Pacific, including Australia, New Zealand, Tasmania, New Guinea, Polynesia, and Melanesia; sometimes restricted to first three; *map,* **264–5;** Wallace's line, **1072.**
**Austra'lia,** island-continent in S. Hemisphere; pop. 5,500,000; area (with Tasmania) 2,974,581 sq. mi.; **261–9,** *maps,* **264–5, 262, 2624–5;** animal life, **265–6, 1046–7, 1090, 1584, 1907–8, 2092;** chief cities, **628, 2194–5, 3424;** commerce and industries, **264, 3424, 3732, 3787;** government, **267, 269, 555, 173, 628, 3779;** Great Barrier Reef, **886;** literature, **268;** national song, **2405;** natives, **266, 464,** *pictures,* **465, 2119, 3141;** physical features and climate, **262, 2973, 1072, 2471, 2514, 2790,** *maps,* **264–5;** plant life, **265, 4, 562;** population, **264, 269,** *map,* **264–5;** states, **2471, 2949–50, 3438–9, 3638.**—*History,* **266–7;** exploration and settlement, **513, 872, 874;** gold rush, **2194–5;** mandates, **513, 1072;** in World War, **2453, 3796.**
**Australian Alps,** range in s.e. Australia nearly parallel with coast; includes Mt. Kosciusko (7350 ft.), highest point on continent; *maps,* **264–5.**
**Australian ballot, 321.**
**Aus'tria,** republic in cent. Europe, formerly an empire; 32,000 sq. mi.; pop. 6,500,000; **269, 270,** *maps,* **271, 1196–7,** *Study Outline,* **3909;** national hymn, **2405;** Tyrol, **3573–4;** Vienna, cap., **3641–2.**
*History,* **273;** chief events, **1659, 1660;** Hapsburg house, **1576, 1578, 3642;** battle of Sempach (1386), **3752;** Frederich III, **1360;** Maximilian gains Burgundian lands, **2441, 697;** under Charles V, **690–1;** separation from Span. Hapsburgs, **2763;** Thirty Years' War (1618–48), **3488–9, 1553–4, 447;** Bohemia acquired, **447;** Turks besiege Vienna (1683), **3559, 3642;** in War of Span. Succession, **2150, 3612;** under Maria Theresa, **2147, 1294;** War of Austrian Succession (1740–48), **2147, 3180;** Seven Years' War, **3180, 2147, 1360;** partition of Poland, **2856;** in wars of Fr. Rev. and Napoleon, **1368, 1370, 2393, 2394, 2396;** Holy Roman Empire dissolved (1806), **1355, 1448, 2395;** Congress of Vienna, **1448, 1196, 3642;** Cracow annexed, **915;** Francis Joseph I (1848–1916), **1354;** revolution of 1848, **1945, 1703;** loses Ital. provinces, **1837, 670, 1399, 3638;** Seven Weeks' War, **1448, 428;** Dual Monarchy formed (1867), **1703, 273;** in Triple Alliance, **1196;** Balkan policy, **310, 3177, 3790;** Bosnia-Herzegovina annexed, **468;** in World War, **3789–3812, 1662;** peace settlement, **3807–8, 3642, 947–8, 3539.**
**Austria-Hungary,** former dual monarchy in cent. Europe; 261,241 sq. mi.; pop. 51,000,000; **270–3; 269, 1702–4,** *map,* **271;** chief cities, **3641–2, 524.** *See also in Index* **Austria; Hungary.**
**Austrian Netherlands.** Name given to Span. Netherlands after their cession to Austria (1713); consisted chiefly of provinces now composing Belgium.
**Austrian Succession, War of** (1740–48), **2147, 3180.**
**Austro-Prussian War.** *See in Index* **Seven Weeks' War.**
**'Autocrat of the Breakfast Table, The',** by O.W. Holmes, **1674.**
**Auto da fe** (*ȧ'tō dä fā*), in Inquisition, **1780, 3304.**
**Autolycus** (*ȧ-tŏl'ĭ-kŭs*), peddler in Shakespeare's 'A Winter's Tale', **3757,** *picture,* **3194.**
**Automatic elevators, 1132.**
**Automatic pistol, 1256.**
**Automatic telephone, 3460.**
**Automo'bile, 274–87;** brakes, **278, 287;** carbureter, **282;** cellulose curtains, **673;** chassis, **279;** clutch, **283;** cooling system, **281;** differential, **285–7;** economic value, **274;** engine, **280–2;** foreseen by Roger Bacon, **301;** gears, **278, 283–5;** good roads, **3024;** history, **276;** magneto, **1052;** manufacture, **277, 999;** petroleum, **2755;** speedometer, **971;** steering mechanism, **280;** storage battery, **3361–2;** timing devices, **280, 282;** tires, **3075–6;** tractors, **43,** *picture,* **47;** in warfare, **274–5, 217.**
**Auton'omy.** Self-government; used not only in absolute sense, but especially of countries which, while subject in some matter to another power, are in other respects self-governing; thus some of Brit. colonies have administrative or constitutional autonomy, which amounts practically to self-government.
**Autumn,** how caused, *picture,* **1063;** nature study in, **2412.**
**Autumn coloration** of leaves, **1981–2, 3537.**
**Autumnal equinox, 1173,** *chart,* **1063.**
**Auvergne** (*ō-vĕr'nyĕ*) **Mts.,** branch of Cévennes in s.-cent. France; picturesque scenery; **1345.**
**Auxil'iary verbs, 3627.**
**Av'alanche, 288.**
**Av'alon,** in Arthurian legends, **223.**
**A'vars,** a people of Ural-Altaic stock allied to the Huns; settled Dacia about 555; **689, 1195, 3250.**
**Avatar',** in Hinduism, **1651.**
**Avebury** (*āv'bûr-ĭ*), **Lubbock, Sir John,** first **Baron** (1834–1913), Eng. archeologist, anthropologist, and entomologist, **139.**
**Avena** (*ȧ-vē'nȧ*), the oat genus, **2549.**
**Av'entine Hill,** southernmost of the seven hills of Rome, **3056;** temple of Minerva, **2248.**
**Aven'turine,** a form of quartz, **2945.** Found chiefly in Ural Mts.
**Avernus** (*ȧ-vĕr'nŭs*). Small lake near Naples, Italy, in crater of extinct volcano; ancients thought it entrance to infernal regions.
**Averroes** (*ȧ-vĕr'ō-ēz*) (1126–98). Arabian philosopher; commentaries on Aristotle.
**Avery, Captain John,** famous pirate, **2810.**
**Avery, Mrs. Rachel Foster** (1858–1919), **3778.**
**Aves** (*ā'vēz*), the bird class of animals, **412.**
**Aves'ta** or **Zend-Avesta, 3842, 2736.**
**Avia'tion, 54–68.** *See also in Index* **Airplane.**
**A'viator,** U.S., insignia, *pictures,* **3576, 3577.**
**Avicenna** (*ăv-ĭ-sĕn'ȧ*) (980–1037). Arabian philosopher and physician; European medicine in Middle Ages guided by his works, based on Galen, Hippocrates, and Aristotle.
**Avignon** (*ȧ-vē-nyôn'*), France, pop. 50,000; medieval walls; silk mills, extensive trade; on Rhone R., **3012;** scat of the popes, **454, 3607,** *picture,* **1349.**
**Avila** (*ȧ'vē-lȧ*), Spain, fortified city; pop. 12,000; *picture,* **3303.**
**Aviles** (*ȧ-vē-lās'*), **Pedro Menendez de.** *See in Index* **Menendez.**
**Avlo'na** or **Valona.** Chief port of Albania; retained by Italy; pop. 6500.
**Avocado** (*ăv-ō-kä'dō*), a fruit, **1378.**
**Avocet** (*ăv'ō-sĕt*), a shore-bird, **2839, 414.**
**Avogadro** (*ä-vō-gä'drō*), **Amadeo** (1776–1856). Ital. physicist; formulator of Avogadro's law.
**Avogadro's law.** That under the same temperature and pressure equal volumes of all gases contain the same number of molecules.
**Avoirdupois** (*ăv-ôr-dụ-poiz'*) **weight, 3715;** origin, **3714.**
**Avon** (*ā'von*), several rivers in Gt. Brit.; most famous, branch of Severn, flows s.w. in cent. England through Stratford-on-Avon, birthplace of Shakespeare; at Stratford, **3369,** *picture,* **1190;** at Bristol, **510;** canal, **3482.**
**Awns,** or beard, of barley, *picture,* **331.**
**Axel Heiberg Island,** an Arctic isl. n. of Canada, *map,* **602–3.**
**Axes,** of Stone Age, *picture,* **3361.**
**Axis,** of earth, **1063, 1064, 1391, 3862.**
**Axis deer,** native to India, **980,** *picture,* **980.**
**Axminster** (*ăks'mĭn-stēr*), England. Market town on Axe R. 24 mi. n.e. of Exeter; pop. 3000; ancient church; celebrated for rugs formerly made there.
**Axminster carpet, 3080,** *picture,* **3078.**
**Aye-aye,** a Madagascar lemur, **1986.**
**Ayesha** (*ī'ĕ-shȧ*) (610?–677?), wife of Mohammed, **2276, 2278.**
**Aymara** (*ī-mä-rä'*) **Indians,** S. Amer. tribe, living around L. Titicaca; high culture before conquest by Incas; *picture,* **3287.**
**Ayolas, Juan de, 2677.**
**Ayr** (*ĕr*), Scotland, summer resort and seaport on Firth of Clyde, 30 mi. s.w. of Glasgow; pop. 34,000; textiles, leather, ships; birthplace of Burns, **542.**
**Ayres spelling scale, 3314–5.**
**Ayr'shire cattle, 950.**
**"Ay, tear her tattered ensign down!", 2423.**
**Aza'lea,** plant, **288, 3012, 1678.**
**Azerbaijan** (*ä-zĕr-bī-jän'*), a republic of Soviet Russia on w. coast of Caspian Sea; 40,000 sq. mi.; pop. 4,600,000; oil fields; cap. Baku; **664, 3084,** *map,* **1196–7.**
**Azerbaijan,** province of n.w. Persia on Caspian Sea; 32,000 sq. mi.; pop. 2,000,000; iron, lead, copper, marble; cap. Tabriz; **2735.**
**Azhar Mosque,** Cairo, *picture,* **569.**
**Azof** (*ȧ'zŏv*), Russia, town on s. arm of Don R. 20 mi. from mouth; pop. 32,000; fisheries; captured by Peter the Great, **2747.**
**Azof, Sea of,** northern arm of Black Sea; 15,000 sq. mi.; **654, 922,** *map,* **434.**
**Azores** (*ȧ-zōrz'*), group of islands in Atlantic, about midway between Europe and America; 922 sq. mi.; pop. 240,000; **288,** *map,* **63;** geology, **254;** government, **2891;** Portugal acquires, **2888.**
**Azrael** (*ăz'rȧ-ĕl*) (Hebrew, "help of God"). Mohammedan angel of death.
**Aztecs** (*ăz'tĕks*), **288–90;** build Mexitli (Mexico City), **2219;** Cortez conquers, **894–5;** prehistoric intercourse with Asia, **2514;** relics, *pictures,* **2216;** religion, **1250.**
**Azulejo** (*ä-thụ-lā'hō*), a kind of tile, **2889, 3615.**
**Azure,** in heraldry, **1639.**

# B

OUR letter B seems to have started its long career in the shape of a crane, in ancient Egyptian picture writing. Presently the Egyptian scribes gave it a simpler form, which resembled the outline of a tent. So when the Phoenicians and Hebrews took the symbol over into their alphabets, they named it *Beth*, which means "house." The Phoenician form of the letter resembled a tent supported by its pole, but some of these early B's or Beths, it seems, were more aristocratic in their habits than the tent Beths, for Dr. Isaac Taylor—whose story of the alphabet makes two nice fat volumes—says: "Other forms suggest that it represented the plan of a two-chambered eastern house (notice that our big B has two rooms) with the men's apartment on one side and the women's on the other." In sound, B is closely related to *p*, *f*, *v*, and *m*. Just say them over now and see. If you are studying Latin, you will appreciate one of Martial's little jokes on the Spaniards of his day, who pronounced *b* as *v* and *v* as *b*. He said of them that *vivere* (to live) is *bibere* (to drink). This was true in two senses, for the ancient Spaniards not only mixed their *b*'s and *v*'s, but they were heavy drinkers.


**Baal** (*bā'ăl*), Semitic name for a lord, master, or god; especially, sun-god of Canaanites and Phoenicians; **2774.**

**Baalbek** (*bāl-bĕk'*), Syria. Village 35 mi. n.w. of Damascus, famous for splendid Rom. ruins; once finest of Syrian cities; called Heliopolis by Greeks.

**Ba'ba, Cape,** Asia Minor, **227.**

**Bab'bage, Charles** (1792–1871), Eng. mathematician; calculating machine, **572.**

**Babbitt metal,** a soft alloy, **99, 3504.**

**Bab'cock, Maltbie Davenport** (1858–1901), Amer. Presb. clergyman; quoted, **116.**

**Babcock, Stephen Moulton** (born 1843), Amer. agricultural chemist; invents butter-fat test, **950.**

**Babel** (*bā'bĕl*), **Tower of,** built by Noah's descendants to guard against future floods; during construction occurred the "confusion of tongues" (Gen. xi); **295.**

**Bab el Man'deb** ("Gate of Tears"), strait, **227, 2986.**

**Baber** (*bā'bĕr*) (1483–1530), founder of Mogul (Mongol) empire in India, **1752, 2286.**

**Bab'ington, Anthony** (1561–86), page to Mary, Queen of Scots; executed for conspiracy to murder Elizabeth, **2158.**

**Babirussa** (*băb-ĭ-rụ'sà*), wild swine, **1671.**

**Baboons',** or dog-headed monkeys, **2292,** *picture,* **2291;** altitude range, *picture,* **397;** hand, *picture,* **153.**

**Babrius** (*bā'brĭ-ŭs*) (first cent. A.D.), collector of Aesop's fables, **31.**

**Babuyan** (*bä-bọ-yän'*) **Islands.** Most northern portion of Philippines.

**Baby care, 291–4;** child training, **729–35;** milk, **2238–9.**

**Babylon** (*băb'ĭ-lŏn*), cap. of anc. Babylonia, on Euphrates R. 70 mi. s. of Bagdad, **294, 298, 1187;** Alexander enters, **87;** Hanging Gardens, **3177–8,** *picture,* **3179;** paved streets, **3023.**

**Babylonia** (*băb-ĭ-lō'nĭ-à*) **and Assyria,** anc. empires of Tigris-Euphrates valley, **295–300,** *maps,* **298, 1100;** agriculture, **48;** architecture, **176, 294;** Babylon, **294;** brick-making, **502–3;** canals, **625;** counting system, **2542;** engraving, **1168, 1410;** excavations at Babylon, **294,** at Nineveh, **2510;** horse first used, **3524;** irrigation, **1187;** libraries, **1992, 2510;** Mesopotamia, **2201;** myths, **299–300;** Nineveh, **2510;** painting, **2628;** sculpture, **3155–6,** *pictures,* **1206, 3155;** seven-day week instituted, **3713;** slavery, **3248;** sundial invented, **797;** Tigris R., **3499;** writing, **294, 939, 3816–7,** *pictures,* **2739, 3817.** —*History:* chief events summarized, **1655–6;** Israel conquered, **1890;** Hittites conquered, **1669;** Egypt subdued, **1106;** Median invasion, **2191.**

**Babylonian captivity,** of Jews, **1891;** of popes, **454, 1541, 2763, 3607.**

**Bacchanalia** (*băk-à-nā'lĭ-à*), Rom. festival, **1012.**

**Bacchantes** (*bà-kăn'tēz*), attendants of Bacchus, **1012.**

**Bac'chus,** Rom. name for Dionysus, god of wine, **1012.**

**Bach** (*bäĸ*), **Johann Sebastian** (1685–1750), Ger. musician and composer, **300,** *picture,* **2378.**

**Bach'eller, Irving** (born 1859). Amer. novelist, b. Pierrepont, N. Y. ('Eben Holden'; 'D'ri and I').

**Bach'elor** (degree), **832, 827.**

**Bachelor's button.** Name applied to several flowering plants, such as amaranth, buttercup, and chicory.

**Bacillus** (*bà-sĭl'ŭs,* pl. *bà-sĭl'ī*), rod-shaped bacterium, **303, 1450,** *pictures,* **1452, 1450;** size of tuberculosis type, **2227.**

**Back Bay district,** Boston, **470.**

**Backbone.** *See in Index* **Spine.**

**Backhaus** (*bäk'hous*), **Wilhelm** (born 1884). Ger. pianist.

**Backlog fire,** how to make, **598.**

**Back-swimmer,** a water-bug, **3696,** *picture,* **3698.**

**Bacon, Francis, Baron Verulam** and **Viscount St. Albans** (1561–1626), Eng. philosopher, statesman, and writer, **300–1, 1164;** essays, **1178;** founded empiricism, **2773.**

**Bacon, Nathaniel** (1642?–76), leader of "Bacon's Rebellion," **301.**

**Bacon, Roger** (1214?–94?), Eng. monk, scientist, and author, **301, 1799,** *picture,* **712;** knowledge of gunpowder, **1552;** foreshadowed modern physics, **2787;** invented spectacles, **3310.**

**Bacon** (pork), **1671;** food value, **1320, 1321, 1322.**

**Bacteria** (*băk-tē'rĭ-à*), a group of microscopic plants, **302–3, 2822, 3938;** antiseptics, **150–1;** antitoxins, **151–2;** in cheese, **709;** cause disease, **1449–52, 2192, 151;** destroyed or checked by heat, **632, 953,** by cold, **825, 151;** enzymes, **1173;** in milk, **952, 953, 2692;** nitrogen-fixing types, **2511–2, 89, 2829,** *picture,* **810;** as parasites, **396, 2677;** soil-making, **302, 3273;** spraying in farms and gardens, **3330–1;** vaccination, **3613;** resemble yeasts, **3828.** For animal germs *see in Index* **Protozoa.**

**Bacte'rins,** or vaccines, **3613.**

**Bacteriol'ogy, 475;** antitoxins, serums, and vaccines, **151–2, 3613;** germ theory of disease, **1449–52;** Koch, **1450, 2692;** Lister, **150;** micrometer, **2227;** microscope, **2228–30;** Pasteur, **2692, 399.**

**Bac'tria.** Anc. country (modern Balkh) n. of Hindu Kush Mts.; famous for horses and camels; one of earliest homes of Aryans; conquered by Cyrus the Great and Alexander, after whose death a new Bactrian kingdom extended its rule as far as n. India.

**Bactrian camel, 590–1.**

**Badajoz** (*bä-dä-hōth'*), Spain. Historic city on Guadiana R. 5 mi. from Port. frontier; pop. 38,000; taken by French (1811) and recaptured by British (1812).

**Baden** (*bä'dĕn*), republic of s.w. Germany, former grand duchy; 5800 sq. mi.; pop. 2,000,000; **303, 1441.**

**Ba'den** or **Ba'den-Ba'den,** Germany. health resort in Baden at edge of Black Forest; pop. 26,000; 29 hot medicinal springs; **303.**

**Baden-Powell, Agnes, 1464.**

**Baden-Powell, Sir Robert S. S.** (born 1857), Brit. general, hero of Boer War (defense of Mafeking); founded Boy Scouts, **485.**

**Badger,** animal of weasel family, **303–4,** *picture,* **1647;** fur, **1390;** hunted with dachshund, **1023.**

**Badger State, 3773.**

**Bad Lands,** in Neb., **2429;** in N. D., **2522;** in S. D., **3296;** in Wyo., **3818;** *pictures,* **2789, 2524.**

**Baedeker** (*bā'dĕ-kĕr*), **Karl** (1801–59). Ger. publisher of guide books.

**Baekeland** (*bā'kē-länd*), **Leo Hendrik** (born 1863), Amer. chemist, b. in Belgium; invented bakelite, **814.**

**Baer** (*bêr*), **K. E. von** (1792–1876), father of embryology, **1141, 3841.**

**Baeyer** (*bī'yĕr*), **Adolph von** (1835–1917), Ger. chemist; won Nobel prize in chemistry (1905); synthetic indigo, **1777.**

**Baf'fin, William** (1584–1622), Eng. Arctic explorer, discovered Baffin Bay in 1615; **2860.**

**Baffin Bay,** large gulf of n.e. N. Amer.; 800 mi. by 280 mi.; *maps,* **602–3, 189.**

**Baffin Land,** barren isl. belonging to Canada; w. of Greenland; 240,000 sq. mi.; *maps,* **602–3, 616.**

**Bagan'da,** African tribe, **1068.**

**Bagasse** (*bà-gās'*), **3386.**

**Bagdad',** chief city of Mesopotamia; pop. 200,000; 350 mi. n. of Persian Gulf on Tigris R.; **304–5, 2200;** center of Arabian culture, **166, 2278;** Mongol raids, **2201, 2285;** in World War, **3798.**

**Bagdad Railway, 304, 2201, 233, 1449.**

**Bagehot** (*băj'ŏt*), **Walter** (1826–77). Eng. political philosopher, economist, and literary critic ('Physics

and Politics', a novel application of theory of evolution; 'The English Constitution').
**Baggat'away,** Indian name for game of lacrosse, **1954–5.**
**Bagpipe,** a wind instrument, **305, 2383,** *picture,* **2382.**
**Baguio** (*bä-ḡē'ō*), P. I., city, pop. 50,000, **2764.**
**Baguio,** a typhoon, **2765.**
**Bahaism** (*bä'hä-izm*). A religious movement growing out of Babism, which was founded in Persia 1844–45 by Mirza Ali Mohammed (1824–50); under Mirza Hussein Ali (1817–92) its gospel of equality, service, and world unity spread with amazing rapidity in Mohammedan and other countries; Mirza's son, Abdul Baba (1844–1921), who succeeded him as leader, in 1912 visited the U.S., where many societies of Bahaism exist; in 1922 work was begun on the erection of a great Bahai temple near Chicago.
**Bahamas** (*ḅȧ-hā'mȧs*), group of isls., Brit. W. Indies; 4400 sq. mi.; pop. 60,000; **305, 3718,** *map,* **3584–5;** sponge fisheries, **3330.**
**Bahia** (*bä-ē'ȧ*) or **São Salvador,** 3d city of Brazil and former cap.; pop. 350,000; **495;** exports, **3286;** home of navel orange, **2588.**
**Bahi'a Blan'ca,** Argentina. Seaport and r.r. center; pop. 44,000; exports wheat, wool; govt. naval station.
**Bahrein** (*bä-rān'*) **Islands,** in Persian Gulf; pop. 110,000; Brit. protectorate; cap. Manama (35,000); pearl fisheries, **2738.**
**Baikal** (*bī'kăl*), **Lake,** in s. Siberia, **305, 3228;** region home of Mongols, **2285, 2286.**
**Bail** (cricket), **919.**
**Bailey wall,** of medieval castle, **654, 655.**
**Bain, Alexander** (1818–1903). Scotch philosopher, taught at Aberdeen and Glasgow ('Logic').
**Bain'bridge, William** (1774–1833), Amer. commodore; commands *Constitution* in War of 1812, **2423.**
**Baird, Spencer Fullerton** (1823–87). Amer. naturalist; sec. of Smithsonian Institution.
**Baireuth.** *See in Index* **Bayreuth.**
**Baja** (*bä-hä'*) **California,** Mexico. A territory including peninsula of Lower Calif.; 58,338 sq. mi.; pop. 54,000; cap. and chief port, La Paz.
**Bajazet** (*bä-ẏä-zĕt'*) or **Bayazid** (*bä-yä-zĕd'*) **I** (1347–1403), first Ottoman sultan, victor over allied Christian armies at Nicopolis (1396); defeated by Mongols, **2286.**
**Ba'kelite,** an artificial plastic material, **814, 816, 673.**
**Baker, Newton Diehl** (born 1871). U.S. sec. of war 1916–21; b. Martinsburg, W. Va.; mayor of Cleveland 1912–16.
**Baker, Remember** (1740–75). leader of Green Mountain Boys, **3630.**
**Baker, Sir Samuel White** (1821–93). Eng. explorer, discoverer of Albert Nyanza.
**Baker, Mt.,** volcanic peak of Cascade Range in n.w. Wash.; 10,827 ft.; **3687.**
**Bakeries, 497–500.**
**Bakersfield,** Calif. Trading and mfg. city 100 mi. n. of Los Angeles in oil and farming region; pop. 18,638; fruit-packing houses, oil refineries.
**Baker University.** At Baldwin, Kan.; co-ed., Meth. Episc.; founded 1858; liberal arts, normal school, music, oratory, business, art.
**Bakewell, Robert** (1725–95). established scientific stock-breeding, **48.**
**Baking, 496–500, 877–8.**
**Baking powder, 305;** alum in, **104;** chemical action, **10;** cream of tartar in, **3438.**
**Baking soda, 305, 3271, 3272.**
**Bakst** (*bäkst*), **Leon Nikolajewitsch** (born 1886), Rus. designer of stage settings and costumes, **3485.**
**Baku** (*bä-kṵ'*), oil center and seaport, cap. of Republic of Azerbaijan, on w. coast of Caspian Sea; pop. 250,000; petroleum, **654, 1407, 2749, 2752, 2755;** r.r. connections, **664, 3556.**
**Bakunin** (*bä-kṵ'nēn*), **Michael** (1814–76). Rus. anarchist and political agitator; a founder of Nihilism.
**Balaam** (*bā'lȧm*). Prophet disobedient to divine command until miraculously rebuked by his ass; compelled against his will (Num. xx–xxiv) to bless Israel.
**Balaklava** (*bä-lä-klä'vä*), small port of the Crimea, 6 mi. from Sebastopol; scene of famous "charge of the Light Brigade" in battle of Oct. 25, 1854, during Crimean War; **922, 2075, 2509.**
**Balance** (Libra), a sign of the zodiac, **3840.**
**Balance,** how maintained, **1057,** *picture,* **1056.**
**Balance wheel,** of watch, **800.**
**Balata** (*băl'ȧ-tä*), a gum, **1554, 1547.**
**Balboa** (*bäl-bō'ä*), **Vasco Nuñez de** (1475–1517), Span. explorer, discoverer of Pacific, **305–6, 109,** *picture,* **2617;** accompanied by Pizarro, **2814.**
**Balboa,** Pacific port of Panama Canal Zone, **2663.**
**Balbrig'gan.** Various cotton goods, especially hosiery, made of fine unbleached fiber; named for Irish coast town, 22 mi. n. of Dublin, where first made.
**Bald cypress, 946.**
**Bald eagle, 1053, 1055,** *pictures,* **1053, 415.**
**Balder** (*bąl'dẽr*), in Norse myth., god of light, **306, 3135.**
**Baldpate duck,** *picture,* **1045.**
**Baldwin I** (1058–1118). Adventurer prince of first crusade, first king of Jerusalem; crowned 1100; brother of Godfrey of Bouillon.
**Baldwin, "Lucky," 2446.**
**Baldwin, Robert** (1804–58), Canadian statesman, **306–7.**
**Baldwin-Wallace College.** At Berea, Ohio; co-ed., Meth. Episc.; founded 1856 (German Wallace College 1845); classics, philosophy, sciences, law, theology, music, normal training.
**Balearic** (*băl-ē-ăr'ĭk*) **Islands,** Span. province off Mediterranean coast of Spain; pop. 330,000; **307, 2194, 3301;** *maps,* **3300, 1196–7.**
**Baleen' whales, 3724.**
**Balestier** (*bȧl-ĕs-tēr'*), **Charles Wolcott** (1861–91), Amer. writer, **1927.**
**Balfe** (*bălf*), **Michael William** (1808–70). Irish composer ('The Bohemian Girl').
**Balfour** (*bäl'fụr*), **Arthur James, Earl of Whittinghame** (born 1848). Brit. Unionist statesman, premier 1902–05, head of Brit. mission (1917) to U.S. to unify effort against Germany; author ('Foundations of Belief').
**Balfrush,** Persia. Same as **Barfrush.**
**Bali** (*bä'lē*), isl. of Dutch E. Indies, e. of Java; 2100 sq. mi.; exports rice, cocoa, coffee; **1072, 404.**
**Balkan** (*bäl-kän'*) **Mts.,** in the Balkan Peninsula, an extension of the Carpathians; beginning at Iron Gates of Danube, extend s. through Serbia, then turn sharply e. to Black Sea; divide Danube and Maritza watersheds; **1190, 307.**
**Balkan Peninsula,** s.e. peninsula of Europe, **307–10,** *maps,* **308, 1196–7;** modern history summarized, **1661;** Austrian policy, **1354, 3177, 3790;** importance of Macedonia, **2096–7;** mountains, **1190, 1192–3;** Russian interests, **3094;** Russo-Turkish War, **3177, 3560, 1013;** Serbia dominates, **3176;** in World War, **3794–5.**
**Balkan Wars** (1912–13), **310;** Adrianople taken, **26;** Bulgaria, **533;** Greece, **1526;** Montenegro, **2313;** Rumania, **3080;** Serbia, **3176;** Treaty of Bucharest, **523;** Turkey, **3560.**
**Balkash** (*bäl-käsh'*), salt lake in s.w. Siberia, near Chinese border; 330 mi. long; no outlet; 4th largest lake in Eurasia; *map,* **232–3.**
**Balkh** (*bälk*). Dist. of Afghanistan between Hindu Kush Mts. and Amu-Darya R.; anc. Bactria.
**Balk line,** in billiards, **392.**
**Ball, John** (d. 1381), a leader in Wat Tyler's Rebellion, **3571.**
**Ballads,** defined, **2851;** folk songs, **1316–8;** Percy's collection, **1166;** Robin Hood, **3029.**
**Ballarat** (*bäl-ȧ-răt'*), Australia, 2d city of Victoria, 65 mi. n.w. of Melbourne; pop. 40,000; **3638.**
**Bal'last,** in balloons, **312,** *picture,* **316;** submarines, **3376.**
**Bal'lin, Albert** (1857–1918). "One of the makers of modern (pre-war) Germany"; general director of Hamburg-Amer. steamship line, which he developed from insignificance to predominance.
**Balliol** (*bāl'yȯl*) **College,** Oxford, founded, **2610.**
**Bal'listite,** an explosive, **1212.**
**Ball lightning, 2007.**
**Balloon, 310–20;** dirigibles, **313–6;** early types, **310–2;** helium, **320, 1629;** highest ascents, **52,** *picture,* **51;** hydrogen, **312, 320, 1710;** parachute, **2674;** "sausage" or "kite," **316, 320;** use in meteorology, **3708,** *pictures,* **3709, 314;** use in warfare, **314, 316–7, 2422–3,** *picture,* **3792.**
**Ballot, 320–1;** introduced in England, **1468.**
**Ball's Bluff,** Va. A bluff on Potomac R. about 33 mi. above Washington; Confederate force under Gen. Evans defeated Union force and killed its commander, Col. Edward D. Baker, Oct. 21, 1861.
**Balm,** a fragrant herb of the mint family, **2258;** also a balsam (*see in Index* **Balsam**).
**Balmaceda** (*bäl-mä-thä'dä*), **José Manuel** (1838–91), elected president of Chile 1886; instituted democratic reforms and extensive public works; made self virtual dictator; defeated (1891) in civil war; **738.**
**Balm of Gilead.** An aromatic resin obtained from a small oriental evergreen tree belonging to myrrh family.
**Balmor'al Castle,** favorite residence of Queen Victoria, **3640,** *picture,* **3147.**
**Balop'ticon, 3354.**
**Balsa** (*bąl'sȧ*), a raft, *picture,* **443.**
**Balsam fir, 1248.**
**Balsamo** (*bäl'sä-mō*), **Joseph.** *See in Index* **Cagliostro.**
**Balsam poplar, 2880.**
**Balsams,** various mixtures of volatile oils and resins exuded by trees; Canada balsam, **1248;** in perfumes, **2728;** Peruvian, **3118.**
**Bal'sas River,** in s. Mexico, flows 500 mi. w. to Pacific, *map,* **2209.**
**Bal'tic, battle of the, 321, 2435.**
**Baltic Provinces,** collective name of former Rus. provinces of Courland, Livonia, Esthonia; now comprised in independent states; Esthonia, **1180;** Latvia, **1969;** Lithuania, **2030.**
**Baltic Sea,** arm of North Sea, **321,** *maps,* **1196–7, 2531, 1440;** amber, **106;** coast, **1248, 1440, 3402;** fisheries, **1190;** navigation in winter, **3401;** Russia gets foothold, **2747.**
**Bal'timore, Cecilius Calvert,** 2d **Baron** (1605?–75), founds Maryland, **2163.**
**Baltimore, George Calvert,** first **Baron** (1580?–1632). Founder of Avalon colony in Newfoundland (1621); applied for charter for Maryland, which was granted after his death to his son Cecilius.
**Baltimore,** chief city of Md.; pop. 733,826; on Patapsco R. 14 mi. from Chesapeake Bay; **322, 2162;** attacked by British, **3672.**

**Baltimore & Ohio Railroad,** 2162, 2963.
**Baltimore clippers,** 3208.
**Baltimore oriole,** 2601, *picture,* 2600.
**Baluchis** (*ba-lų'chēz*), people, 2735.
**Baluchistan** (*bä-lų-chĭ-stän'*), country in s. Asia on Arabian Sea, in extreme w. corner of Indian Empire; 134,638 sq. mi.; pop. 835,000; partly (Brit. Baluchistan) under Brit. rule; **1744, 1745, 226;** *maps,* 232–3, 1744.
**Balzac** (*bäl-zäk'*), **Honoré de** (1799–1850), Fr. novelist, 323, 2541, 1365.
**Bambai Mumba,** 451.
**Bamberg** (*bäm'bĕrĸ*), Germany. Bavarian city 33 mi. n. of Nuremberg; pop. 50,000; 11th cent. cathedral; large breweries, cotton and woolen mills.
**Bamboo',** a tropical tree-like grass, **323–4, 1502, 3533;** found in Burma, 541, China. 744, India, 1748, Indo-China, 1777, Japan, 1866, Siam, 3227; paper made from fiber, 2667; rate of growth, 1503.
**Bamian** (*bä-mĭ-än'*). Valley and pass in Afghanistan 60 mi. n.w. of Kabul; colossal Buddhist idols carved in rock and other historic remains; city destroyed (1222) by Genghis Khan.
**Banan'a,** a tropical fruit, **324–6;** Australia, 264; Cent. Amer., **896, 1545, 1676, 2505;** E. Africa, 1068; Fiji Isls., 1239; flour, 325; imports into U.S., 2469; Manila hemp from *Musa textilis,* 1630, 325; Mexico, 2213; S. Amer., 836, 1547; W. Indies, 936, 1859, 1860.
**Ban'at of Temesvar** (*tĕm'ĕsh-vär*), fertile dist. lying between Danube and Theiss rivers and Transylvanian Alps; 11,000 sq. mi.; formerly part of Hungary, now divided between Rumania and Jugo-Slavia; 1901.
**Ban'bury,** England. Market town in Oxfordshire; center of Puritanism in 17th cent.; pop. 13,000; "Ride a cock horse to Banbury Cross."
**Ban'croft, George** (1800–91), Amer. historian and statesman, b. Worcester, Mass.; as sec. of navy to Pres. Polk, planned Naval Academy at Annapolis ('History of the United States'); 114.
**Bancroft, Hubert Howe** (1832–1918). Amer. historian, b. Granville, Ohio ('West American Historical Series', covering histories of 12 states, Alaska, British Columbia, Mexico, and Central America).
**Band, brass,** distinguished from orchestra, 2590.
**Bandages,** how to make, **1267–8.**
**Ban'da Islands,** part of Molucca Archipelago in Dutch E. Indies; pop. 9500; nutmegs and mace; 2545.
**Bandarab'bas,** Persia. Seaport on Strait of Ormuz, Persian Gulf; pop. 20,000; exports fruit, tobacco, wool, carpets, opium.
**Banda Sea,** in Malay Archipelago, s. of Isl. of Ceram and n. of Timor; *map,* 1073.
**Bandelier** (*băn'dĕ-lēr*), **Adolph F. A.** (1840–1914). Amer. archeologist, b. Switzerland; leading authority on archeology of s.w. U.S., Mex., and S. and Cent. Amer.
**Banderillero** (*bän-dā-rē-lyā'rō*), 2211.
**Ban'dicoot,** a marsupial, 1908.
**Band saw,** 2082, 3516.
**Banff** (*băm'f*), Alberta, famous resort in Canadian Rockies, 83; nearby scenery, *pictures,* 511, 600, 602, 603.
**Bangalore** (*băn-gą-lōr'*), chief city of Mysore, India; pop. 190,000; Brit. military station; textiles; 1746.
**Bangkok',** cap. of Siam, near mouth of Menam R.; pop. 540,000; 326, 3226, 3227.
**Ban'gor,** Me., on Penobscot R. 60 mi. from sea; pop. 25,978; woodworking plants, shipyards, paper mills, etc.; state univ. law school; 2126.
**Bangor.** Old cathedral city on coast of Wales; pop. 11,500; seat of bishopric since 6th cent.; University College of N. Wales; slate quarries.
**Bangs, John Kendrick** (1862–1922). Amer. humorist, b. Yonkers, N. Y. ('A Houseboat on the Styx'; 'Mr. Bonaparte of Corsica'; 'The Foothills of Parnassus'; 'The Idiot').
**Bangweo'lo Lake,** in N. Rhodesia, 150 mi. long; formed by headstreams of Congo; discovered by Livingstone, 2035.
**Banjermasin** (*bän-jĕr-mä'sēn*). Chief town in Dutch Borneo, built chiefly on piles; pop. 50,000; exports spices, gold.
**Ban'jo,** a stringed instrument, 326.
**Banknote,** 2282, 328; how made, 2284, 3598; Federal Reserve Board, 1230. *See also in Index* **Money.**
**Bank of England,** 2051–2.
**Bank of Genoa,** 1412.
**Bank of North America,** 2329.
**Bank of the United States,** 3678, 2108, 1856–7; opposed by Loco Focos, 2871; Tyler opposes reëstablishment, 3571.
**Bankruptcy,** voluntary or involuntary legal admission by a debtor that he is unable to pay his debts in full, 326–7.
**Banks, Sir Joseph** (1743–1820), Eng. naturalist; accompanied Capt. Cook 1768–71; first man to study marsupials of Australia; discovered geysers in Iceland; trained fishes, 131.
**Banks, Nathaniel Prentiss** (1816–94). Amer. soldier and politician, b. Waltham, Mass.; speaker U.S. House of Representatives 1856; gov. of Mass. 1858–61; Federal general in Civil War; in House of Representatives 1864–77.
**Banks and banking,** 327–9; banknotes, 2282, 328; building and loan associations, 528; coöperative banks, 879; credit, 917–8; farm loan banks (U.S.), 1224, 328; Federal Reserve System, 1230, 3746; Hamilton establishes first national bank, 1569; interest and discount, 2724–6; Lombards in Middle Ages, 2047; London's banking district, 2051–2; money, 2281–4; N. Y. the center for U.S., 2496, 2485; postal savings bank, 2894, 2896, 3599; trust companies, 3546; U.S., Treasury supervision, 3598. *See also in Index* **Finance.**
**Banks Land,** Canadian isl. in Arctic Ocean, 189, *map,* 602–3.
**Banks of Newfoundland.** *See in Index* **Newfoundland Banks.**
**Bank swallow,** 3398, 3399.
**Ban'nock** or **Ban'aks,** Indian tribe of n.w. plateau region of U.S.; formerly roamed through s. Idaho; 1767.
**Ban'nockburn, battle of,** 518, 1088.
**Banquo** (*băn'kō*). Scotch thane in Shakespeare's 'Macbeth' murdered by Macbeth; his ghost appears to his murderer at a royal feast.
**Bantam** (*băn-tăm'*). Seaport of Java, formerly important; 60 mi. w. of Batavia; gave name to bantam fowls.
**Bantock, Granville** (born 1868). Eng. composer ('Atalanta in Calydon'; 'Vanity of Vanities'; 'Omar Khayyam'; 'Hebridean Symphony').
**Ban'tu,** group of tribes in Cent. and S. Africa including Kaffirs, Zulus, Bechuanas, Basutos, 37; huts, *picture,* 38.
**Ban'yan tree,** 329, 1319; India, 1748.
**Baobab** (*bā'ō-băb*), or monkey-bread tree, 3532, 34.
**Bapaume** (*bä-pōm'*), France, village in n.e. 14 mi. s. of Arras; Ger. victory over French in 1871; in World War, 3275, 3806.
**Baptism,** 764, 2937; of Jesus, 1888.
**Baptistery,** of Florence, 1848, *picture,* 1294.
**Baptists,** Protestant denomination which holds that baptism should be by immersion; world membership about 8,966,000; beginnings in England, 2937; in America, 3742.
**Barabas** (*bär-ăb'ăs*). Marlowe's 'Jew of Malta', an avaricious, murderous monster; type humanized by Shakespeare into Shylock.
**Barab'bas.** A robber released by Pilate on demand of Jews when Jesus was condemned.
**Barada** (*bą-rä'dą*), small r. of Syria flowing through Damascus; supposedly the Abana of the Bible; 954.
**Baranof** (*bä-rä'nŏf*) **Island,** chief of Alexander Isls., Alaska; 100 mi. long; town of Sitka on w. coast; *map,* 2514–5.
**Barataria** (*bä-rä-tä'rē-ä*) **Bay,** La., pirates of, 1549.
**Barb,** racing horse, 1685.
**Barb,** pigeon, 2804.
**Barbados** (*bär-bā'dōz*), isl. of Brit. W. Indies; pop. 200,000; 166 sq. mi.; 329, *map,* 3288–9.
**'Barbara Frietch'ie',** poem by Whittier, 781.
**Barbarism,** a state of society between savagery and civilization, 771–2.
**Barbarossa** (*bär-bą-rŏs'ą*) ("red beard"), nickname for Frederick I, 1358.
**Barbarossa, Khair-ed-Din,** Turkish pirate who terrorized Mediterranean in 16th cent., 3550.
**Barbary sheep,** or aoudad, 3198.
**Barbary States,** region of N. Africa inhabited by Berbers; includes Morocco, Algeria, Tunis, and Libya; 2323; center for pirates, 2810, 682, 691; Decatur's expedition, 971.
**Barbed wire,** 3758.
**Bar'bels,** the "feelers" of fish, 1274.
**Barber, John,** Eng. inventor, 1404.
**'Barber of Seville',** opera by Rossini, 3181.
**Barberry,** an ornamental shrub, 1628; harbors wheat rust, 3099, 3101; *pictures,* 3100.
**Barberton,** Ohio, mfg. city 7 mi. s. of Akron on Ohio Canal; pop. 18,811; matches, match machinery, sewer pipes, boilers; 2570.
**Barbizon** (*bär-bē-zôn'*) **school,** in painting, 2632, 2240, 893.
**Barbuda** (*bär-bų'dą*). One of Leeward Isls. in Brit. W. Indies; 62 sq. mi.
**Barbusse** (*bär-büs'*), **Henri** (born 1875). Fr. novelist ('Under Fire', vivid portrayal of horrors of war; 'Inferno').
**Bar'ca.** Same as **Cyrenaica.**
**Barcelona** (*bär-sē-lō'nä*), seaport and chief mfg. center of Spain; pop. 622,000; 329–30, 3301; harbor, *picture,* 3303.
**Bardell', Mrs.** Widow in Dickens' 'Pickwick Papers', plaintiff in case of Bardell *v.* Pickwick; teaches Mr. Pickwick to 'beware of vidders'.
**Barebone's Parliament,** 2689.
**Bareilly** (*bä-rā'lē*) or **Bareli,** India, trade center in United Provinces, 150 mi. e. of Delhi; pop. 130,000; massacre of Europeans in mutiny of 1857, 1745.
**Ba'rents, Willem** (d. 1597). Dutch explorer; discovered Spitzbergen.
**Barfleur** (*bär-flûr'*). A small seaport and summer resort of n.w. France, 15 mi. e. of Cherbourg; important port in Middle Ages.
**Barfrush'** or **Balfrush.** A trading town in Persia, on Bahbul R. 12 mi. from Caspian Sea; pop. 50,000; rice, cotton, silk.
**Barge Canal,** N. Y., 627, 2484–5, *map,* 1511.
**Bargello** (*bär-jĕl'lō*) **Palace,** in Florence, 1848.
**Barham** (*bär'ăm*), **R. H.** *See in Index* **Ingoldsby, Thomas.**
**Bar Harbor,** Me., summer resort; resident pop. 13,622; 2128.
**Bari** (*bä'rē*). Seaport in s.e. Italy on Adriatic; pop. 110,000; anc. Barium; several old churches; extensive commerce and mfrs.

**Bar'ing.** Family of Eng. financiers and bankers, who assumed international importance in 19th cent. *See in Index* **Ashburton; Cromer.**

**Barium** (*bā'ri-ŭm*), a metallic element; in glass-making, **1472;** sulphide, phosphorescent properties, **2776;** sulphate (barytes), in paints, **2642.**

**Bark,** of shrubs and trees, **330,** *picture,* **3531;** function, **2827;** lacking in palms, **3532;** used in tanning, **1975–6.** *See also* names of trees.

**Bark** or **barque,** a sailing vessel, **3209.**

**Bar'kantine,** a sailing vessel, **3209.**

**Barker, Granville** (born 1877). Eng. playwright; thoughtful, skilful, unromantic drama ('The Voysey Inheritance'; 'Waste'; 'The Madras House').

**Barking deer,** or muntjac, **981.**

**"Barkis is willin'."** The famous message sent by the shy carrier in Dickens' 'David Copperfield' to Peggotty, David's nurse, whom he wants to marry.

**Bar-le-Duc** (*bär-lē-dük'*), France. A quaint old town 125 mi. e. of Paris; pop. 17,000; world-famous for its currant jam.

**Barley, 330–1;** in Australia, **264;** in Canada, **608;** in Europe, **1346, 1440, 303, 3086, 3404;** in U.S., **2252, 578, 2525, 3770, 3297;** growth of root, *picture,* **672;** malt, **2131;** rusts and smuts, **3099, 3100.**

**Barleycorn,** unit of measure, **3713, 3714.**

**Barleycorn, John.** Personification of intoxicating liquors.

**Barley sugar, 3389.**

**Barlow, Joel** (1754–1812). Amer. poet ('Hasty Pudding'; 'The Columbiad').

**Barmecides** (*bär'mē-sīds*). Persian family, powerful under early Abbassid califs (8th cent.); "Barmecides' feast," meaning an imaginary banquet, comes from the 'Arabian Nights', where a Barmecide jests at a hungry man's expense by placing empty dishes before him.

**Bar'men,** Germany. *See in Index* **Elberfeld-Barmen.**

**Bar'nabas,** fellow-laborer with the Apostle Paul; Epistle of, **390.**

**'Barnaby Rudge'.** Dickens' novel based on the Gordon riots (1780).

**Barnacle,** crustacean which lives attached to ships' bottoms, piles, etc., **331;** detached by fresh water, **3169.**

**Bar'nard, Frederick A. P.** (1809–89). Amer. scientist and educator, b. Sheffield, Mass.; pres. of Columbia College 1864–88; Barnard College was named in his honor.

**Barnard, George Grey** (born 1863), Amer. sculptor, b. Bellefonte, Pa.; **1591, 3164.**

**Barnard, Henry** (1811–1900). Amer. educator, b. Hartford, Conn.; founder and editor of *American Journal of Education,* and first U.S. commissioner of education.

**Barnard College,** New York City, for women; founded 1889; arts and sciences; part of Columbia Univ., **829.**

**Barnardo** (*bär-när'dō*), **Thomas John** (1845–1905). Brit. philanthropist, founder of over 100 Barnardo Homes which sheltered and trained 60,000 children before his death.

**Barnburners,** nickname of faction of Democratic party in N.Y. state 1844–52, so called because of their radical reform policy, **2871, 3617.**

**Barnes, George Nicoll** (born 1859). Brit. labor leader, engineer by trade; in House of Commons after 1896; Minister of Pensions 1916–17; in war cabinet 1917–20; labor representative at Peace Conference.

**Barneveldt** (*bär'nē-vĕlt*), **Jan Van Olden** (1547–1619). Dutch statesman; secured Twelve Years' Truce with Spain 1609; unjustly beheaded for treason.

**Barn'helm, Minna von.** The clever generous heroine of Lessing's comedy 'Minna von Barnhelm'.

**Barn owl, 2606, 2607,** *picture,* **415.**

**Barns'ley,** England. A market and mfg. town in Yorkshire, 12 mi. n. of Sheffield; pop. 54,000; coal fields; iron, steel, linen mfrs.

**Barn swallow, 3398, 3399,** color plate, **419;** nest, *picture,* **407.**

**Bar'num, Phineas Taylor** (1810–91), Amer. showman, b. Bethel, Conn.; **510, 1128.**

**Baroda** (*bà-rō'dà*), India. Trade and r.r. center in e.-cent. India, 250 mi. n. of Bombay, cap. of native state of same name; pop. 100,000.

**Barom'eter, 332–3;** carried to heights by balloons, **312,** *picture,* **314;** principle of mercury type, **53.**

**Bar'on,** a member of the lowest order in the Brit. peerage; in House of Lords, **2687.**

**Bar'onet.** An inheritable title in Gt. Brit. ranking next below that of baron; the highest degree of honor borne by commoners; abbreviated *Bart.*

**Barons' Wars,** in England, **1634, 2316–7, 1087.**

**Baroque** (*bà-rōk'*) **style,** in architecture, **188;** in sculpture, **3158.**

**Barr, Amelia E.** (1831–1919). Amer. novelist, b. in England ('Bow of Orange Ribbon'; 'Friend Olivia').

**Barr, Robert** (1850–1912), Scotch-Canadian writer, **624.**

**Barrage** (*bär-räzh'*), in artillery fire, **3791;** mines in North Sea, **3518–20.**

**Barrage** (*bär'ȧġ*), a barrier; in Nile, **1094.**

**Bar'ra Island,** Hebrides, **1625.**

**Barramun'da,** a lung-fish, **2363, 2364.**

**Barranquilla** (*bär-än-kēl'yä*). Seaport of Colombia on Magdalena R. 7 mi. from mouth; pop. 66,000; terminus of river traffic; exports coffee, hides.

**Barras** (*bä-rä'*), **Paul, Comte de** (1755–1829). Fr. statesman; unscrupulous, time-serving member (1795–99) Fr. Directory.

**Bar're,** Vt., in n. center 5 mi. s.e. of Montpelier; pop. 10,008; important granite production, **3633.**

**Barred owl, 2606–7,** *pictures,* **2606, 2411.**

**Barrel,** a unit of measure, **3715.**

**Barrel cactus, 202.**

**Barren Ground caribou, 644.**

**Barren Lands,** region in Canada, **1970, 2528, 603.**

**Bar'rett, John** (born 1866). Amer. diplomat; director-general of Pan-American Union, 1907–20; b. Grafton, Vt.

**Barrett, Lawrence** (1838–91). Amer. Shakespearean actor long associated with Edwin Booth, b. Paterson, N.J.

**Barrias** (*bà'rē-às*), **Louis Ernest** (1841–1905), Fr. sculptor, **3158;** statue of boy Mozart, *picture,* **2363.**

**Bar'rie, Sir James Matthew** (born 1860), Scotch novelist and dramatist, **333–7;** chief plays, **1038;** story of 'Peter Pan', **334–7.**

**Barrie,** Ontario. City and summer resort on L. Simcoe, about 60 mi. n.w. of Toronto; pop. 7000; building materials, machine-shop products, flour, boilers, shoes.

**Barrier reefs,** off-shore reefs formed by corals, **886, 262.**

**Barron, James** (1768?–1851), Amer. commodore, b. in Va.; in command of *Chesapeake* when attacked by Brit. *Leopard;* kills Decatur, **971.**

**Barrow, Sir John** (1764–1848). Eng. traveler and writer; secretary to the Brit. Admiralty 1804–45; did more for Arctic exploration than any other man of his day.

**Bar'row-in-Fur'ness,** England. Seaport in Lancashire 50 mi. n.w. of Liverpool; pop. 77,000; iron mines; iron and steel works, shipyards.

**Barrow River,** 2d largest r. of Ireland, in s.e.; flows e. and s. 120 mi. to Atlantic, forming with Suir R. Waterford Harbor; **1807.**

**'Barry Lyn'don'.** Novel by Thackeray; a little picaresque masterpiece in which a rogue is made to dissect his own character.

**Barrymore, Ethel** (born 1879). Amer. actress, b. Philadelphia ('Captain Jinks'; 'Alice-Sit-by-the-Fire'; 'Mid-Channel'; 'Déclassé').

**Barrymore, John** (born 1882). Amer. actor; appeared in 'The Fortune Hunter'; 'Are You a Mason?'; 'Peter Ibbetson'; 'Redemption'; 'Richard III'.

**Barrymore, Maurice** (1847–1905). Eng. actor, father of Ethel and John; real name Herbert Blythe; leading man for Mme. Modjeska, Mrs. Langtry, Olga Nethersole, Mrs. Fiske.

**Bar-sur-Seine** (*bär-sür-sān'*). Historic town of e. France, on left bank of Seine, 20 mi. s.e. of Troyes; pop. 3000; devastated in 1359 by English and suffered in later wars.

**Barter,** exchange of articles without use of money, **2281;** in anc. times, **772;** in Asia, **228;** in early Egypt, **1100;** in furs, **1389.**

**Barthelemy, Peter, 929.**

**Bartholdi** (*bär-tōl-dē'*), **Frédéric A.** (1834–1904), Fr. sculptor; spent 20 years and a private fortune organizing the gift to the U.S. from Fr. nation of his 'Liberty Enlightening the World', now in N.Y. harbor; **3158, 2487.**

**Bartholomew** (*bär-thŏl'ō-mū*), **Saint,** one of Twelve Apostles, **157.**

**Bartholomew's fair, 1219.**

**Bar'tlesville,** Okla., city in n.e.; pop. 14,417; center of Mid-Continent oil field; farming and zinc smelting interests; natural gas; **2576.**

**Bartlett, John** (1820–1905). Amer. editor and publisher, b. Plymouth, Mass. ('Familiar Quotations'; 'Concordance to Shakespeare').

**Bartlett, Paul Wayland** (born 1865), Amer. sculptor, b. New Haven, Conn.; portrait statues of Lafayette, Gen. Joseph Warren, Benjamin Franklin; six heroic figures for entrance N. Y. public library; **3164.**

**Bartlett pear, 2701.**

**Bartlett plum, 2840.**

**Bartolommeo** (*bär-tō-lōm-mā'ō*), **Fra** (1472–1517). One of the great painters of the Florentine Renaissance; adherent of Savonarola, after whose death he became Dominican monk; excelled in composition and treatment of draperies.

**Barton, Clara** (1821–1912), Amer. teacher and volunteer nurse; founder of Amer. Red Cross, **337–8, 2986.**

**Barton, Sir Edmund** (1849–1920). Australian statesman; first prime minister of Australian Commonwealth 1901–03; later member of Federal High Court.

**Bar'tram, John** (1699–1777). "Father of Amer. botany," b. Chester County, Pa.; called by Linnaeus "greatest natural botanist in the world." "Bartram's Gardens," first botanical gardens in Amer., are now owned and maintained by the city of Philadelphia.

**Baruch** (*bā'rŭk*), **Bernard M.** (born 1870). Amer. financier; member Advisory Commission, Council of National Defense 1916–18; chairman War Industries Board 1918–19.

**Baruch,** apocryphal book of Old Testament, **390.**

**Barye** (*bä-rē'*), **Antoine Louis** (1796–1875), Fr. sculptor of animals; **3158;** 'Theseus Slaying the Centaur', *picture,* **3160.**

**Bary'tes,** use in paints, **2642.**

**Basalt',** a fine-grained, heavy igneous rock, often solidified into prismatic columns, *pictures,* **1809, 3148.**

**Bascule** (*bās'kūl*) **bridges, 506,** *pictures,* **507, 509.**

**Base,** in chemistry, **8, 10, 2201.**
**Baseball, 338–41.**
**Basel** (*bä'zĕl*) or **Bâle,** 2d city of Switzerland and chief trade center; on Rhine near n. border; pop. 135,000; prominent in Reformation; univ. (founded 1460); Church Council at, **764;** Holbein and Erasmus in, **1672, 1673.**
**Base line,** in surveying, **3397, 1960.**
**Bashan** (*bā'shăn*). Rich dist. in anc. Palestine, beyond the Jordan; famed for cattle of great size ("bulls of Bashan").
**Bashkirtsef** (*băsh-kĕrt'sĕf*), **Marie** (1860–84). Brilliant versatile Rus. painter and author; famed after death through her 'Journal'.
**Basidiomycetes** (*bă-sid-i-ō-mī-sē'tēz*), class of fungi with spore-bearing stalks, **1382, 3938;** mushrooms and puffballs, **2375;** rusts and smuts, **3099.**
**Basil** (*băz'il*) **the Great** (329–379), early father of Gk. church, bishop of Caesarea in Cappadocia; founder of Eastern monasticism, **2298–9, 764.**
**Basil'ica, 179;** of St. Anthony, at Padua, *picture,* **1846.**
**Basilicata** (*bä-sē-lē-kä'tä*), dist. in s. Italy (anc. Lucania), forming province Potenza; pop. 500,000; people speak dialect called *basilisco;* **1841.**
**Bas'ilisk, hooded,** a lizard, **2036–7, 1729.**
**Basin,** in physiography, **2791.**
**Basket, 341–3.**
**Basketball, 343–5;** Chinese girls at play, *picture,* **748.**
**Basket boats, 445,** *pictures,* **448, 443.**
**Basket shell, 3201,** *picture,* **3203.**
**Basques** (*bąsks*), people inhabiting Basque provinces in n.e. Spain and s.w. France, **3301, 1344;** legend of Roland, **3038.**
**Basra** (*bäs'rä*), also **Busra** or **Bassora,** port of Mesopotamia on Shat-el-Arab, 70 mi. from Persian Gulf; pop. 80,000; large trade; exports dates; occupied Nov. 1914 by Brit. troops; **3499.**
**Bas-relief** (*bä-rĕ-lēf'*), or "low relief," **3154,** *picture,* **3157.**
**Bass** (*bąs*), a fish, **1278;** related to fresh-water sunfish, **3396.**
**Bass** (*bās*) **voice,** lowest range of, **3278.**
**Bassanio** (*bäs-sä'nē-ō*), in Shakespeare's 'Merchant of Venice', **2199.**
**Bass clarinet, 3781.**
**Bass drum, 1042,** *picture,* **2382.**
**Bassein** (*bä-sān'*), Burma. Trading town and port in delta of Irrawaddy R., 90 mi. from sea; pop. 37,000; mills and exports rice.
**Basselisse** (*bäs-lēs'*), a tapestry weave, **3434.**
**Bas'set,** hunting-dog, **1021.**
**Basse-Terre** (*bäs-tĕr'*), cap. of Guadeloupe; pop. 9000; **1545.**
**Bass horn,** or tuba, **1680, 1681,** *picture,* **2382.**
**Bassoon',** musical instrument, **2383, 3781, 2591.**
**Bas'sora.** Same as **Basra.**
**Bassora gum, 1552.**
**Bass** (*bąs*) **Strait,** channel between Australia and Tasmania; 80 to 150 mi. broad; **3439.**
**Bass viol,** or double bass, **3646,** *picture,* **2382.**
**Basswood,** Amer. linden tree, **2018;** classified, **3533;** seeds, **3172.**
**Bastia** (*bäs-tē'ä*), chief city of Corsica, on n.e. coast; pop. 25,000; **894.**
**Bastille** (*bąs-tēl'*), prison fortress in Paris, built in 1369 to protect palace of Charles V; destroyed by mob at outbreak of Fr. Rev., **1368,** *picture,* **1366.**
**Bastina'do,** method of torture, *picture,* **2919.**
**Basting,** in sewing, **3184.**
**Basu'toland,** Brit. crown colony, S. Africa, n.e. of Cape Colony; 11,716 sq. mi.; pop. 405,000; **3283.**
**Bat,** a winged mammal, **345–6;** altitude range, *picture,* **397;** evolutionary position, *diagram,* **128;** hibernation, **1646, 1647;** wing, *picture,* **1572.**
**Batangas** (*bä-tän'gäs*), P. I. Seaport of Luzon 60 mi. s. of Manila; pop. 40,000; U.S. military post.
**Bata'via,** seaport on n. coast of Java, cap. and chief trade center of Dutch E. Indies; pop. 235,000; exports coffee, sugar, tea, rice, spices; scene in, *picture,* **1879.**
**Batavia,** N. Y. City 36 mi. n.e. of Buffalo; pop. 13,541; plows, agricultural implements, metal goods, rubber goods.
**Bates, Arlo** (1850–1918), Amer. writer, b. in Maine ('Talks on Writing English'; 'The Diary of a Saint'); professor of English in Massachusetts Institute of Technology 1893–1915.
**Bates, Blanche** (born 1873). Amer. actress, b. Portland, Ore.; married George Creel 1912 (Shakespearean rôles; 'Under Two Flags'; 'Madame Butterfly'; 'The Girl of the Golden West').
**Bates, Edward** (1793–1869), U.S. atty.-gen. 1861–64, *picture,* **2015.**
**Bates, Harry** (1850–99), Eng. sculptor, pupil of Rodin; 'Socrates' (relief), *picture,* **3271.**
**Bates College.** At Lewiston, Me.; co-ed.; chartered 1864; arts and letters.
**Bath,** England, famous watering place 95 mi. w. of London on Avon R.; pop. 69,000; hot springs; remains of Rom, baths, **3331.**
**Bath,** Me., port and summer resort on Kennebec R. 12 mi. from sea, with coastwise and foreign trade; pop. 14,731; shipbuilding and other mfrs.; **2126.**
**Bath, Order of the, 979.**
**Baths, 1713–4;** for babies, **292–3;** effect, **3246;** Roman, **3052, 3058, 2876,** *picture,* **3057.**
**Bathsheba** (*băth-shē'bà*). Wife of Uriah the Hittite, whom David later married (II Samuel xi); mother of Solomon.
**Bathurst** (*băth'ûrst*), Australia, town in New South Wales 110 mi. n.w. of Sydney; pop. 10,000; center of wheat region; gold, copper, silver mines; **2471.**
**Bathurst,** New Brunswick. Summer resort on Chaleurs Bay and Nepisiguit R.; pop. 3500; fine salmon fishery, lumber mills.
**Bathurst Island,** large isl. in Arctic Ocean, *map,* **602–3.**
**Bathurst Island,** n. of Australia in Timor Sea, *map,* **264–5.**
**Batik** (*bä-tēk'*) **dyeing, 1049.**
**Baton Rouge** (*băt'ŏn rųzh*), La., cap., r.r. center, and port on Mississippi R. 73 mi. n.w. of New Orleans; pop. 21,782; various mfrs.; during Civil War occupied by Federal troops after capture of New Orleans; **2071, 2266, 2268;** capitol, *picture,* **2069;** state univ., **2068.**
**Batrachia** (*bă-trā'ki-ȧ*). Same as **Amphibia.**
**"Battalion of Death,"** in Russia, **106.**
**Bat'tenberg.** Family name of medieval Ger. counts; revived 1851 for morganatic wife of Alexander of Hesse and princely rank bestowed upon her descendants; Princess Victoria Eugénie married Alfonso XIII of Spain (1906). *See in Index* **Alexander of Battenberg.**
**Battersea** (*băt'ĕr-sē*), England, metropolitan borough of s.w. London; pop. 168,000; fine park bordering Thames, 185 acres; **2056.**
**Battery.** In artillery, unit of four or more guns, corresponding to company in infantry.
**Battery,** electric, **1113,** *picture,* **1109;** in automobiles, **278, 279;** furnishes "current" electricity, **1110, 1108;** storage battery, **3361–2;** devised by Volta. **1120.**
**Battery, The,** public park in New York City, **2488.**
**Battle, Mrs.** In Lamb's 'Essays of Elia', an enthusiastic whist player who loved "a clear fire, a clean hearth, and the rigor of the game."
**Battle Abbey,** on battlefield of Hastings, **1596.**
**Battle above the Clouds,** or battle of Lookout Mountain, **700.**
**Battle Creek,** Mich., city 44 mi. s.w. of Lansing on Kalamazoo R.; pop. 36,164; Battle Creek Sanitarium (established 1866); mfg. center for cereals; large car shops; **2224.**
**'Battle Hymn of the Republic', 2405.**
**Battles, world's greatest.** *See* list on next page.
**Battleships,** modern, **2423, 2428,** *picture,* **2426.** *See also in Index* **Ships.**
**Battles of the World War,** list, **3810.**
**Batu** (*bä-tų'*) **Islands.** Group in Dutch E. Indies, w. of Sumatra; 445 sq. mi.; inhabited by Malays; coconuts and other forest produce.
**Batum** (*bä-tųm'*), Georgia, port on Black Sea; pop. 46,000; terminus of r.r. and of petroleum pipe line from Baku; **1434, 664.**
**Baux** (*bō*) or **Beaux.** A village in s. of France, near Arles; gives name to bauxite ore.
**Bauxite** (*bōz'it*), chief aluminum ore, **104;** in Ala., **70;** in Ark., **207;** electrolysis, **1125.**
**Bavaria** (*bà-vā'ri-ȧ*), republic in s. Germany; pop. 6,900,000; 30,819 sq. mi.; **346–7, 1441, 1442–3;** Danube in, **961;** Munich, **2369–70.** —*History,* **1447, 2395, 2370, 3808.**
**Bavarian Alps, 3573.**
**Bavarians,** Ger. barbarian tribe, **1194.**
**Baxter, Richard** (1615–91). Eng. Puritan preacher and scholar, called the "chief of the English Protestant Schoolmen" ('The Saint's Everlasting Rest').
**Bay,** in physiography, **2788.**
**Bay** or **bay-tree, 1970;** classified, **3533;** leaves used for spice, **3319.**
**Baya** (*bä'yä*) **bird, 3710.**
**Bayard** (*bī'ärd*), **James Asheton** (1767–1815). Amer. statesman, b. Philadelphia; U.S. senator, envoy to Russia, member of commission which negotiated Treaty of Ghent with Gt. Brit.
**Bayard, Pierre du Terrail, Chevalier de** (1476–1524). Fr. military commander of time of Charles VIII and Francis I; called savior of France in war with Charles V; pattern of chivalry, "the good knight without fear and without reproach."
**Bayard, Thomas Francis** (1828–98). U.S. sec. of state 1885–89; ambassador to Gt. Brit. 1893–97; b. Wilmington, Del.
**Bayberry,** or wax myrtle, a shrub; wax used in candles, **3706;** seeds, *picture,* **3172.**
**Bay City,** Mich., important port on Saginaw Bay; pop. 47,554; beet-sugar, boats, lumber; **2226.**
**Bayern** (*bī'ĕrn*), Ger. form of Bavaria, **347.**
**'Bayeta's Grandmother's Blanket',** story, **204–7.**
**Bayeux** (*bä-yû'*), France, historic town in Normandy, famous for old cathedral, rebuilt by William the Conqueror, and for Bayeux Tapestry, **2513.**
**Bayeux tapestry, 2513.**
**Bayazid.** Same as **Bajazet.**
**Bay laurel, 1970.**
**Baylor University.** At Waco, Tex.; Baptist, co-ed.; chartered 1845; collegiate course; also schools of fine arts, medicine, pharmacy.
**Bayonne** (*bä-yŏn'*), France. Historic town and fortress 4 mi. from Bay of Biscay; pop. 28,000; mfg. and export trade; 13th cent. cathedral; gave name to bayonet, first made here.

**Bayonne,** N. J., port on Upper New York Bay, and principal petroleum-distributing center on Atlantic; pop. 76,754; immense coal docks, radiator plants, iron works; **2458;** pipe-line terminal, *picture,* **2753.**
**Bayou** (*bī'ų*), **1957;** Louisiana, **2068;** Mississippi R., **2266.**
**Bayou State, 3347.**
**'Bay Psalm Book', 2379, 111.**
**Bayreuth** (*bī-roit'*), Germany, city in Bavaria 126 mi. n. of Munich; pop. 33,000; home of composer Wagner; noted for Wagnerian musical festivals; **3663, 2027.**
**Bay rum.** A toilet preparation made by mixing oil of bay with diluted alcohol and adding oil of allspice and oil of orange peel.
**Bazaar',** oriental market place; in Cairo, **567;** Damascus, **956;** Delhi, **989–90, 991;** Peking, **2708.**
**Bazaine** (*bă-zān'*), **François Achille** (1811–88), Fr. marshal; commander-in-chief of the main Fr. armies in Franco-Prussian War; in siege of Metz, **2207.**
**Bazan** (*bà-thän'*), **Emilia Pardo** (1851–1921). Span. novelist ('Los Pazos de Ulloa'; 'La Madre Naturaleza').
**Beach, Rex** (born 1877). Amer. writer of stories of adventure, b. Atwood, Mich. ('The Spoilers'; 'The Barrier'; 'The Winds of Chance').
**Beach-combers, 2624.**
**Beachy Head.** Chalk cliff (532 ft.) in Sussex, England, 3 mi. from Eastbourne; Dutch and Eng. fleet defeated (1690) by French.
**Beacon** (*bē'kŏn*), N.Y. A city on Hudson R. opposite Newburgh, formed in 1913 by merging two villages; pop. 10,996; embroidery, hats, rubber goods.
**Beacon,** a signal fire, *picture,* **3455;** lighthouses, **2003–6.**
**Beacon Hill,** Boston, **469, 470.**
**Bea'consfield, Earl of, 1013.** *See also in Index* **Disraeli.**
**Beads,** as money, **3202, 2281;** anc. Egypt, **1471.**
**Beagle,** hound used in hunting, **1021, 1023.**
**'Beagle',** ship in which Darwin made five-year voyage around the world, **963, 964.**
**Beak,** of various birds, *pictures,* **410;** boll weevil, *picture,* **904;** bug, **1787;** cuttlefish, *picture,* **942;** duck, *picture,* **1044;** fish, **1274;** octopus, **943.**
**Beaked whales, 3726.**
**Bean,** fruit of various leguminous plants, chiefly of genus *Phaseolus,* **347–9;** sometimes applied to other bean-shaped fruit, such as castor bean, **657;** food value, **2238, 2926, 2777;** geotropic and phototropic properties, **2827–8;** Mexican bean or frijole, **2213;** seed structure, **3173,** pictures, **348;** silage crop, **3240;** soy, **3297;** when and how to plant, **1397.**
**Bean bag,** how to make, **3186.**
**Bean family** (*Fabaceae* or *Leguminosae*), includes the leguminous or pod-bearing plants such as alfalfa, **88–90;** beans, **347–9;** clover, **809–10;** peas, **2698.** For detailed analysis and references *see* Study Outline, **3941.**

## SOME OF THE WORLD'S MOST IMPORTANT BATTLES

**Arbela** (331 B.C.): Alexander the Great finally defeated Darius III of Persia, and became master of Asia.

**Armada, Spanish** (1588): Flotilla of nimble Eng. ships defeated great Span. war fleet in English Channel; death-blow to Spain's mastery of the seas.

**Austerlitz** (1805): "Battle of Three Emperors"; Napoleon defeated united forces of Russia and Austria under Alexander I and Francis II.

**Blenheim** (1704): English and Austrians under Marlborough and Eugene defeated French and Bavarians under Tallard in War of Spanish Succession; dissipated Louis XIV's dreams of universal conquest.

**Cannae** (216 B.C.): Frightful battle in which Hannibal annihilated great Rom. army; Rome's existence threatened.

**Chaeronea** (338 B.C.): Philip of Macedon gained mastery of all Greece.

**Châlons** (451): Romans and Visigoths under Aetius and Theodoric checked Attila's advance in France, saving w. Europe from the Huns.

**Crécy** (1346): Edward III and Eng. longbowmen won victory over a vastly superior Fr. army of cavalry; greatly strengthened Eng. position in France.

**Gettysburg** (1863): Union troops under Meade sharply defeated Lee, forcing his retreat from northern soil; one of decisive battles of Civil War.

**Hastings** (1066): William, Duke of Normandy, defeated English, their king, Harold, falling in battle; established Norman rule over England.

**Jutland** (1916): Most important naval conflict of World War, in North Sea; after heavy losses on both sides, Brit. fleet, under Jellicoe and Beatty, forced retreat of Ger. vessels.

**Leipzig** (1631): Swedes and Saxons under Gustavus Adolphus won brilliant victory over Cath. Imperialists, and saved Protestant cause in Thirty Years' War; also called Breitenfeld.

**Leipzig** (1813): "Battle of the Nations"; overwhelming defeat inflicted upon Napoleon by allied forces; marked end of Fr. rule in Germany; turning-point in Napoleonic wars.

**Lepanto** (1571): Venetian and Span. fleets under Don Juan of Austria decisively defeated Turkey in Gulf of Corinth, ending Turkish sea power.

**Manila Bay** (1898): Dewey, Amer. admiral, destroyed Span. fleet in harbor and took forts and city without loss.

**Marathon** (490 B.C.): Miltiades, with a small force of Athenians and Plateans, routed large Persian army, saving Greece from Asiatic conquest.

**Marne, First Battle of the** (1914): Fr. and Brit. forces under Joffre and French checked Ger. invasion in four-day battle and drove them back to R. Aisne, where battle line remained nearly stationary for three years.

**Marne, Second Battle of the** (1918): Counter-offensive launched by Foch with Fr. and Amer. troops; placed Germans permanently on defensive.

**Metaurus** (207 B.C.): Romans under the consul Nero defeated Hasdrubal (who was slain) and his Carthaginians, thus preventing the union of Hasdrubal and Hannibal, saving Italy.

**Meuse-Argonne** (1918): In battle lasting 47 days, Americans under Pershing fought through Argonne forest, broke through Ger. lines, and crossed the Meuse R.

**Nile** (1798): Naval battle in Aboukir Bay, Egypt; Nelson destroyed Fr. fleet, cutting off Napoleon from France.

**Orleans** (1429): Joan of Arc raised Eng. siege; turning-point in Hundred Years' War.

**Plassey** (1757): British under Clive defeated forces of Suraj-ud-Dowlah, nawab of Bengal; established Brit. rule in India.

**Plevna** (1877): After five months' siege the Russians forced the surrender of this pivotal strategic point by the Turks, virtually concluding Russo-Turkish War.

**Poitiers** (1356): Victory of Black Prince over King John of France; many prisoners taken, including John; ended first period of Hundred Years' War.

**Poltava** (1709): Peter the Great of Russia completely defeated Charles XII of Sweden, annihilating his army; Russia succeeded Sweden as the leading power of the North at conclusion of the Great Northern War.

**Quebec** (1759): British under Wolfe stormed and took Quebec after gallant defense by Fr. general, Montcalm, securing Brit. domination of N. Amer.

**Sadowa** (1866): Crushing defeat administered to Austria by Moltke; led to exclusion of Austria from German Confederation; also called Königgrätz.

**Salamis** (480 B.C.): Athenian fleet built by Themistocles almost annihilated Persian fleet; forced withdrawal of Xerxes from Greece.

**Santiago** (1898): Amer. fleet commanded by Sampson destroyed Spain's Atlantic fleet under Cervera, forcing surrender of Span. army in Cuba.

**Saratoga** (1777): Surrender of Burgoyne and his Brit. army to Amer. general, Gates; turning-point in Rev. War.

**Sea of Japan** (1905): Japan destroyed Rus. navy and became a world power; also called Tsushima.

**Sedan** (1870): Prussians under Moltke defeated MacMahon and forced surrender of Napoleon III and 100,000 men; caused fall of Fr. Empire and proclamation of Third Republic.

**Somme** (1916): English and French took offensive for five months; made small gain in territory at enormous cost, but relieved Verdun and aided Russia in gaining eastern victory.

**Syracuse** (413 B.C.): Syracusans with Spartan aid destroyed Athenian fleet, dealing a death-blow to Athens' naval supremacy and contributing to her defeat in the Peloponnesian War.

**Tannenberg** (1914): Hindenburg stopped the Rus. invasion of E. Prussia.

**Teutoburger Wald** (9 A.D.): Germans under Arminius (Hermann) annihilated Rom. army commanded by Quintilius Varus; established Rhine and Danube as northern Rom. frontier.

**Thermopylae** (480 B.C.): Heroic effort of Leonidas and a small body of Spartans to check Persian hordes of Xerxes in their march on Athens; Athens destroyed.

**Tours** (732): Charles Martel and the Franks forced the retreat of the Saracens, saving western Europe from Moslem invasion.

**Trafalgar** (1805): Nelson destroyed the combined Fr. and Span. fleets, firmly securing England's sea power, the chief menace to Fr. conquests.

**Valmy** (1792): French commanded by Dumouriez defeated troops of "First Coalition" under Brunswick, saving revolutionary govt. from destruction at hands of invaders.

**Verdun** (1916): General Pétain retained fort in spite of supreme effort by Germans, thus keeping barred the road to Paris and increasing the confidence of the Allied forces.

**Vicksburg** (1863): Grant cut the Confederacy in two by capture of city after severe siege; capitulation, with Gettysburg, marked turning-point in war.

**Waterloo** (1815): English, Prussians, and allies under Wellington and Blücher effected final overthrow of Napoleon.

**Yorktown** (1781): Americans and French under Washington forced surrender of Lord Cornwallis with 7000 men, practically ending Revolutionary War.

**Ypres, First Battle of** (1914): British prevented Germans from reaching Calais and occupying channel ports.

**Bear, 349–55;** altitude range, *picture,* **397;** duration of life, **126;** emblem of Bern, **386;** evolutionary position, *diagram,* **128;** in India, **1748;** foot, **1322,** *picture,* **1323;** fur, **1390;** hibernation, **1646;** related to seals, **3167.** —*Stories:* 'The Story of Johnny Bear', **351–4;** 'How Big-Head Slew the Cave-Bear', **668–70.**
**"Bear,"** in finance, **441.**
**Bear, Great,** constellation, **872,** *chart,* **873.**
**Beard, Daniel Carter** (born 1850). Amer. artist, author, naturalist, and "outdoor lifer," b. Cincinnati, Ohio; pioneer in boy scout movement ('American Boys' Handy Book'; 'Dan Beard's Animal Book').
**Beard, Thomas,** first Amer. shoemaker, **3221.**
**Bearded vulture, 3662.**
**Bear Flag Revolt,** rising against Mex. govt. (1846) by U.S. immigrants in Calif.; so called from flag with grizzly bear declaring Calif. a republic; **580.**
**Bear-grass, 3835.**
**Bear Mountain,** highest point in Conn., **866.**
**Bear River,** in Utah and Idaho, flows in tortuous course of 450 mi. from Uinta Mts. to Great Salt L., *map,* **3610.**
**Bear State, 207.**
**Beaton** (*bā'tŏn*) or **Bethune, David** (1494?–1546), only Scotch cardinal; able but unscrupulous statesman, arrogant, cruel, and immoral; **1941.**
**Beatrice** (*bē'ȧ-trĭs*), in the 'Divina Commedia', the "glorious lady" of Dante's mystic adoration, and his guide through Paradise; identified with a certain Beatrice Portinari (1266–90) whom he saw when they were both children, and but seldom thereafter; **958, 959, 960.**
**Beatrice.** In Shakespeare's 'Much Ado About Nothing', witty, lively, scornful girl who falls in love with the scoffing Benedick, her professed detestation.
**Beatrice,** Neb., city 38 mi. s. of Lincoln; pop. 9664; farming center; dairying interests, mfrs.; **2432.**
**Beatty** (*bā'tĕ*), **David,** first **Earl** (born 1871), commander of Brit. Grand Fleet in World War, **355–6.**
**Beaucaire** (*bō-kār'*), **Monsieur.** Hero and title of romance by Booth Tarkington; Frenchman of royal blood who poses as a barber in England.
**Beaugency** (*bō-zhŏn-sē'*), France. Historic town on Loire R. 15 mi. s. of Orleans; pop. 3500; victory of Joan of Arc over English (1429); Fr. defeated in Franco-German War; cloth and leather; grain trade.
**Beauharnais** (*bō-är-nā'*), name of well-known Fr. family; Alexandre, Vicomte de (1760–94), marries Josephine (later empress), **1901.**
**Beauharnais, Eugène** (1781–1824), son of Empress Josephine, **1901, 2395.**
**Beauharnais, Hortense** (1783–1837), daughter of Empress Josephine, and wife of Louis Napoleon, **1901.**
**Beaumarchais** (*bō-mär-shā'*), **Pierre Augustin Caron de** (1732–99), Fr. politician, dramatist, and satirist; aided Amer. Revolutionists; chief works, **1038.**
**Beaumont** (*bō'mŏnt*), **Francis** (1586?–1616), Eng. dramatist whose association with John Fletcher formed a 'perfect union in genius and friendship' which has left their names inseparably connected; **1034, 1164;** chief works, **1038;** quoted, **3718.**
**Beaumont,** Tex. Port on Neches R. 30 mi. from Gulf of Mexico; pop. 40,422; owes its rapid growth (pop. 9427 in 1900) to discovery of oil; lumber center.
**Beauregard** (*bō'rĕ-gärd*), **Pierre Gustave Toutant** (1818–93), Confederate general; attacks Ft. Sumter, **776, 1333.** Surrendered with Johnston to Sherman (1865).
**"Beauty is truth," 1914.**
**Beauvais** (*bō-vā'*), France, cap. of Oise, 42 mi. n.w. of Paris; pop. 20,000; Gobelin tapestry, textile mfrs.; famous cathedral begun in 13th cent.; tapestry, *picture,* **3435.**
**Beaver, 356–8;** altitude range, *picture,* **397;** engineering skill, **130;** factor in settlement of U.S., **3582;** fur, **1390;** giant fossil type, **138;** teeth, **3454;** yields castor perfume, **2728.**
**Beaver Dam Creek, battle of.** *See in Index* **Mechanicsville.**
**Beaver Falls,** Pa. Borough on Beaver R. 28 mi. n.w. of Pittsburgh; pop. 12,802; abundant water-power and coal for mfg.; iron and steel, clay, pottery, glass, cork products.
**Beaver State, 3347.**
**Bebel** (*bā'bĕl*), **Ferdinand August** (1840–1913). Ger. socialist; helped form Ger. Social Democrat party.
**Beccaria** (*bĕk-kä-rē'ä*), **Cesare** (1735–94). Ital. publicist and political economist whose 'On Crimes and Punishments' had immense influence in removing barbarous punishment from penal codes.
**Bêche-de-mer** (*bāsh-dē-mĕr'*), a sea-cucumber, **3165, 2623.**
**Bechuanaland** (*bĕch-u-ä'nȧ-lănd*) **Protectorate,** region of S. Africa ruled by native chiefs under Brit. protection; 275,000 sq. mi.; pop. 126,000; **3283, 3282,** *maps,* **40–1, 3282.**
**Beck'et, Thomas** (1118–70), archbishop of Canterbury, **358;** shrine in Canterbury, **637, 2807, 701.**
**Becky Sharp,** in Thackeray's 'Vanity Fair', clever, fascinating, unscrupulous adventuress, **3479.**
**Becquerel** (*bĕk-rĕl'*), **Antoine Henri** (1852–1908), Fr. physicist; Nobel prize winner in 1903; discoverer of radio-activity (Becquerel rays), **2959.**
**Beddoes** (*bĕd'ōz*), **Thomas** (1760–1808), Eng. scientist, **969.**
**Bede** (*bēd*), **Beda** (*bā'dȧ*), or **Baeda** (673?–735), Eng. monk known as "The Venerable Bede," and "Father of English History"; gentle, pious, humble scholar, greatest in Saxon England ('Ecclesiastical History of the English Nation', chief source of information for period covered); translates Gospel of St. John, **387.**
**Bedford, John, Duke of** (1389–1435), son of Henry IV of England and brother of Henry V; regent of France, **1634.** In Shakespeare's 'Henry IV' he is the sober sensible Prince John of Lancaster, foil for wild Prince Hal.
**Bedford,** England, cap. of Bedfordshire on Guse R. 45 mi. n.w. of London; pop. 42,000; famous grammar school founded 1552; home of John Bunyan, **534.**
**Bedford,** Ind., 65 mi. s.w. of Indianapolis; pop. 9076; center of great limestone quarries; **2010.**
**Bed'fordshire.** S. midland county of England; 466 sq. mi.; pop. 206,000; agriculture, stock-raising.
**Bed'ivere, Sir, 3069.**
**Bed'lam.** The hospital of St. Mary of Bethlehem in London; founded 1247 as a priory; afterward became insane asylum.
**Bedloe's** or **Liberty Island,** N.Y., **2487.**
**Bed'ouins,** wandering Arabs of Arabian, Syrian, and N. African deserts, **165, 230;** in Egypt, **1092, 1093;** horses, **1685;** Sahara, **3105.**
**Bee,** an insect, **359–64;** alfalfa, **89;** bumblebee, **362–3;** clovers, **809, 810;** drone, **362;** honey, **362;** leaf cutter bee, **364,** text facing **358,** eggs, *picture,* **1091;** mandibles, *picture,* **1782;** metamorphosis, *pictures,* **1787;** queen, **360, 362;** social instincts, **359–63, 1786, 130;** solitary types, **363–4;** sting, *picture,* **1786;** worker, **359–60.**
**Bee'be, Charles W.** (born 1877). Amer. ornithologist and author, b. Brooklyn, N.Y. ('Our Search for a Wilderness').
**Bee-bread, 360.**
**Beech,** a shade tree, **364–5;** Antarctic, "farthest south" among trees, **3533;** autumn coloration, **3537;** classified, **3533;** leaf, **3536.**
**Beecher, Henry Ward** (1813–87), Amer. preacher, greatest of his time, who warmed the stern New England theology with the conception of divine paternal love; champion of abolition, woman suffrage, and other unpopular causes; b. Litchfield, Conn.; **3368, 3778;** quoted, **116.**
**Beecher, Lyman** (1775–1863), Amer. theologian, called "father of more brains than any other man in America"; b. New Haven, Conn.; **3368.**
**Beechnut, 364, 365.**
**Beef,** cattle, **663;** cuts, *pictures,* **2185;** food value, **2238, 1321, 1322;** "jerked" beef, **3608;** production cost, **1671;** preparation and packing; **2180–5.** *See also in Index* **Cattle; Meat packing.**
**"Beef-eaters,"** in Tower of London, **2050.**
**Beef tapeworm, 3813.**
**Beehive coke oven, 824.**
**Beelzebub** (*bē-ĕl'zē-bŭb*) or **Baalzebub.** In Old Testament, heathen god (II Kings i, 3, 6); in New Testament, prince of devils; in Milton's 'Paradise Lost', Satan's chief lieutenant.
**Bee-marten,** or kingbird, **1925.**
**Beer, 84;** fermentation, **3828, 1232;** Bavarian production, **347, 2369–70.**
**Beerbohm** (*bēr'bŭm*), **Max** (born 1872). Eng. author and caricaturist ('Zuleika Dobson'; 'The Happy Hypocrite'; 'Seven Men'; 'And Even Now').
**Beersheba** (*bĕ-ēr'shē-bȧ*). Anc. village 50 mi. s.w. of Jerusalem; referred to in Bible as southern limit of Palestine: "Dan to Beersheba."
**Beeswax, 360, 362;** how made by bees, *picture,* **361;** preparation from honeycomb, **3706.**
**Beet, 365;** as garden crop, **1397.**
**Beet, sugar,** any kind with high sugar content, **365,** *picture,* **3387;** as commercial crop, **3388, 3385.** —*Europe:* Austria, **270,** Belgium, **372,** France, **1346,** Germany, **1440,** Hungary, **1702,** Netherlands, **2438,** Russia, **3086,** Sweden, **3404.** —*U.S.:* Calif., **581,** Colo., **840, 841,** Idaho, **1727,** Utah, **3610,** Wyo., **3820.**
**Beethoven** (*bā'tō-vĕn*), **Ludwig von** (1770–1827), Ger. composer and musician, **365–6, 2380,** *picture,* **2379;** birthplace, **454;** chief works, **2380.**
**Beetles, 366–71, 1788, 1784, 1785;** eye, *picture,* **1215;** foot and claw, *pictures,* **1784, 1323;** head, *picture,* **1782;** June bug, **1902;** killed by sprays, **3330;** "lady-bird," **1955;** mandibles, *picture,* **1782;** phosphorescent (fire-flies), **1262–3;** potato-bug, **2902;** sacred scarab, **1410;** "water," **3698;** weevils, **3713;** wings, **1787.**
**Begon** (*bē-gôn'*), **Michel** (1638–1710). Fr. patron of botany; the begonia named for him, **371.**
**Bego'nia,** a plant, **371.**
**Be'gum of Oudh, 1596.**
**Behe'moth, 1653.**
**Behistun** (*bā'hĭ-stụn*) **rock,** *picture,* **2739.**
**Beirut** (*bā-rụt'*), seaport and mfg. city of Syria; pop. 180,000; exports silk, tobacco, cotton; many Christian missions and schools; **3426, 3807.**
**Békéscsaba** (*bĕk-ĕs-chą'bą*), Hungary. Market town, r.r. junction. 110 mi. s.w. of Budapest; pop. 43,000; linen and hemp fabrics.

**Bel** (*bĕl*). One of the chief Babylonian gods; identified with the Phoenician Baal.
**Belas'co, David** (born 1859), Amer. dramatist and theatrical producer, noted for realistic settings, **1038.**
**Belch, Sir Toby.** In Shakespeare's 'Twelfth Night', Countess Olivia's roystering disreputable uncle.
**Belem** (*bā-lĕn'*). Same as **Para.**
**Bel'fast,** Ireland, pop. 393,000; cap. of Ulster province; **371, 1807–8.**
**Belfort** (*bĕl-fōr'*). Fortified town of e. France, important strategic position near Ger. and Swiss frontiers; taken by Germans in 1871 after 3-months' siege; pop. 40,000.
**Belfort Gap,** between Vosges and Jura Mts., **1903.**
**Bel'gian Congo.** *See in Index* **Congo State.**
**Belgian hare, 1585.**
**Belgium** (*bĕl'ĝi-ŭm*), kingdom of w. Europe bordering North Sea, between Netherlands and France; 11,760 sq. mi.; pop. 7,600,000; cap. Brussels; **372–6,** *maps,* **373, 1196–7;** agriculture, **372, 2900;** army decorations, **979,** *picture,* **977;** 'Brabançonne', national air, **2405;** cabinet government, **555;** chief cities and manufactures, **373–6, 152–3, 520, 1456, 1995, 2073;** commerce, **373, 374, 152, 520, 1456;** mineral resources, **374, 376, 1995;** national flower, **288;** physical features, **372, 376;** population, **372, 376, 1194.** *History,* **372–3, 376;** medieval Flanders, **1289, 518, 3434;** Charles the Bold, **697, 1995;** Hapsburg possession (1477–1797), **520, 697, 690, 2763;** in Renaissance, **2997;** Louis XIV claims, **2065;** France acquires, **1370, 2393;** union with Holland, **2442, 1193, 520;** becomes independent, **2442;** Scheldt R. controversy, **3136;** acquires Congo, **40, 859–60;** woman suffrage, **3779.** —*World War,* **3789–3812, 376, 2199, 81;** Antwerp occupied, **152;** Brussels occupied, **520;** Liége falls, **1995, 3791;** sack of Louvain, **2073, 376;** relief work, **1679, 376;** battles of Ypres, **3833–4, 3792;** raid on Zeebrugge, **520, 3792;** peace settlement, **3811, 376, 860.** *See also in Index* **Netherlands; Flanders;** and names of chief cities.
**Belgrade** (*bĕl-grād'*), cap. of Jugo-Slavia; pop. 90,000; **376–7;** Danube R. at, **962;** in World War, **3794, 3807.**
**Belial** (*bē'lĭ-ăl*). Biblical name of Satan; "sons of Belial," wicked or worthless men.
**Belin'da.** Heroine of Pope's 'Rape of the Lock'. "If to her share some female errors fall, Look on her face, and you'll forgive them all."
**Belisarius** (*bĕl-ĭ-sā'rĭ-ŭs*) (505?–565), Byzantine general to whom Rom. Empire under Justinian I largely owed its safety against Persians, Vandals, Ostrogoths, Goths, and Bulgars, **1905, 3618.** Late legend represents him blinded by Justinian's jealousy, begging for alms in Constantinople streets.
**Belize** (*bā-lēz'*), cap. of Brit. Honduras; pop. 10,000; **1676.**
**Belknap, William Worth** (1829–90). U.S. sec. of war 1869–76; resigned after impeachment on charges of official corruption.
**Bell, Alexander Graham** (1847–1922), Scotch-Amer. scientist and inventor, **379–80,** *picture,* **1119;** experiments with phonopticon, **2003;** system for deaf-mutes, **970;** telephone, **3458, 3461.**
**Bell, Alexander Melville** (1819–1905), Scotch-Amer. educator, b. Edinburgh; father of A. G. Bell; invented "visible speech," a method of phonetic notation for deaf-mutes; **970.**
**Bell, Sir Charles** (1774–1842). Scotch anatomist, greatest discoverer in physiology since Harvey; discoverer of distinction between motor, sensory, and sensori-motor nerves.
**Bell, Currer, Ellis,** and **Acton.** Pen names of Charlotte, Emily, and Anne Brontë.
**Bell, Henry** (1767–1830). Scotch engineer, builder of steamship *Comet* (1812), first successful attempt in Europe to use steam in navigation; said to have supplied ideas to Fulton.
**Bell, 377–9;** "Big Ben," **2054;** "Emperor of Bells" at Moscow, *picture,* **2332;** Liberty Bell, **976;** market at Nizhni-Novgorod, *picture,* **3094;** in orchestra, **2383;** in ship's time, **3501–2.**
**Bel'la Coo'la,** Indian tribe, **1767.**
**Belladonna,** a drug, **2509, 2855.**
**Bellaire',** Ohio. City on Ohio R. 4 mi. below Wheeling, W. Va.; pop. 15,061; in coal, iron, and clay region; glass and enamel wares; large river commerce.
**Bel'lamy, Edward** (1850–98). Amer. author and social reformer, b. Chicopee Falls, Mass. ('Looking Backward', ideal picture of communistic commonwealth).
**Bellay** (*bĕ-lā'*), **Jean du** (1492–1560), Fr. ecclesiastic, **2951.**
**Belleau** (*bĕ-lō'*) **Wood,** France, near Château-Thierry; battle in World War, **380, 2149, 3805.**
**Bellefontaine,** Ohio. City 4 mi. n.w. of Columbus; pop. 9336; automobile bodies, iron and steel bridges, harness, tools, r.r. car repairing.
**Belle Fourche** (*fōrsh*) **Dam, 3294,** *picture,* **3295.**
**Belle Isle** (*bĕl ī*), Detroit, **1000.**
**Belle Isle, Strait of,** channel between Labrador and Newfoundland, n. entrance to Gulf of St. Lawrence from Atlantic; 10 to 15 mi. wide; named from granite isl. at Atlantic end; **3108.**
**Bellerophon** (*bĕ-lĕr'ō-fŏn*), Gk. mythical hero, **2706.**
**Belleville,** Ill. City 14 mi. s.e. of St. Louis, Mo., in coal-mining and agricultural region; pop. 24,823; iron goods, hosiery, shoes, machinery.
**Belleville,** N.J. Residential suburb of Newark, on Passaic R.; pop. 15,660.
**Belleville,** Ontario. Port on Bay of Quinté and Moira R. about 100 mi. e. of Toronto; pop. 12,500; large dairying interests and various mfrs.; Albert Univ.
**Bellingham,** Wash. Shipping center 75 mi. n. of Seattle on Bellingham Bay; pop. 25,585; logging, fishing, dairying interests; canned salmon and fruit, lumber, coal.
**Bellini** (*bĕl-lē'nē*), **Giovanni** (1430?–1516), and **Gentile** (1429–1530), Venetian painters, **2629, 3504.** Giovanni was first great Venetian colorist and most important figure of early Venetian school.
**Bellini, Vincenzo** (1801–35). Ital. operatic composer ('Sonnambula'; 'Norma'; 'I Puritani').
**Bellman, Karl** (1740–95). Swedish lyric poet; poems gay and patriotic in spirit, celebrating the joy of life.
**Bell metal, 378, 515.**
**Belloc** (*bĕl-ōk'*), **Hilaire** (born 1870). Prolific Eng. writer of essays, biography, history, fiction ('Danton'; 'Mr. Clutterbuck's Election'; 'On Nothing'; 'On Anything'; 'General Sketch of the European War').
**Bellona** (*bĕ-lō'nȧ*). In Rom. myth., goddess of war, described as wife or sister of Mars.
**Bellows, George W.** (born 1882), Amer. painter; work characterized by boldness and breadth in execution; often satirical in spirit ('Up the Hudson'; 'Forty-two Kids'; 'Skating'); **2634.**
**Bellows,** in organ, **2598, 2599, 2600.**
**Bell Rock,** reef in North Sea off coast of Forfarshire, Scotland; lighthouse, **2004.**
**Bell telephone system, 3461.**
**Bell-tower,** or campanile; **188, 377;** in Belgium, **373,** *picture,* **519;** Giotto's tower, **1847, 1461,** *pictures,* **1462, 1294, 1834;** leaning tower of Pisa, **2810, 1844,** *picture,* **2811;** St. Mark's, **3624,** *picture,* **182;** Springfield, Mass., **3332.**
**Belly River.** In Alberta, unites with Bow R. to form South Saskatchewan.
**Belmont,** Mass. Town 7 mi. n.w. of Boston; its market gardens furnish early vegetables for that city; pop. 10,749.
**Beloit',** Wis., city on Rock R. near Ill. border; pop. 21,284; scales, wood-working and paper-mill machinery, engines; **3772.**
**Beloit College.** At Beloit, Wis.; co-ed.; chartered 1846 (opened 1847); classics, philosophy, science, art.
**Belphoebe** (*bĕl-fē'bē*). Huntress in Spenser's 'Faerie Queene', representing womanly side of Queen Elizabeth, as Gloriana represents her as ruler.
**Belshazzar** (*bĕl-shăz'ăr*), in the Book of Daniel, last king of Babylon, son and successor of Nebuchadnezzar; warned of his doom by "handwriting on the wall," interpreted by Daniel, **298.**
**Belt of calms, 3750,** *picture,* **3751.**
**Belu'ga.** Same as **White Whale.**
**Bemidji** (*bĕ-mĭĝ'ĭ*), Minn., city and summer resort on Bemidji L., 140 mi. n.w. of Duluth; pop. 7086; **2268.**
**Be'mis Heights,** N.Y. Village in Saratoga County on Hudson R.; first battle of Stillwater in Sept. 1777.
**Benares** (*bĕ-nä'rēz*), India, in n.e., on Ganges R.; pop. 200,000; **380–2, 3079;** pilgrims at, *picture,* **1743.**
**Benavente y Martinez** (*bā-nä-vĕn'tā ē mär-tē'nĕth*), **Jacinto** (born 1866), Span. dramatist; influential in freeing modern Span. stage from artificiality and melodrama; **3307;** chief plays, **1038.**
**Benbecu'la,** isl. of Hebrides, **1625.**
**Bend,** in heraldry, **1639.**
**Bendigo** (*bĕn'dĭ-gō*), Australia, city in Victoria 90 mi. n.w. of Melbourne; pop. 36,000; large gold field; **3638.**
**Ben'edick.** In Shakespeare's 'Much Ado About Nothing', a wit and avowed bachelor who, caught by the same trick that snares Beatrice, falls in love with her, becoming 'Benedick, the married man'.
**Benedict,** popes. For list *see in Index* **Pope.**
**Benedict I** (d. 578), pope, **382.**
**Benedict V** (d. 965), pope, **382.**
**Benedict XIII** (d. 1730), pope, **382.**
**Benedict XIII** (Pedro de Luna), anti-pope, **382.**
**Benedict XIV** (1675–1758), pope, **382.**
**Benedict XV** (1854–1922), pope, **382.**
**Benedict, Saint,** of Nursia (480?–544?), Ital. monk, founder of the Benedictine order, **2299.**
**Benedic'tines,** order of monks, **2299, 382;** costume, *picture,* **2298.**
**Benefit of clergy, 358.**
**Benevento** (*bā-nā-vĕn'tō*) (anc. Beneventum), town 32 mi. n.e. of Naples; pop. 25,000; arch of Trajan (114); battle of (1266), **1293.**
**Beneven'tum, battle of** (275 B.C.), Romans defeat Pyrrhus, **2941.**
**Bengal** (*bĕn-gal'*), province in n.e. India; pop. 45,000,000; 78,700 sq. mi.; **382, 1393,** *map,* **1745;** Brit. rule established, **796, 1596;** cap. Calcutta, **572–3;** rainfall, **1747;** silk culture, **3235.**
**Bengal, Bay of,** portion of Indian Ocean between India and Burma, **1763,** *maps,* **232–3, 1744;** Ganges R., **1393;** monsoon wind, **1747.**
**Bengal'i.** One of chief modern languages of Hindustan; derived from Sanskrit; literature, of modern de-

velopment, known in western world through works of Tagore.
**Bengal tiger,** 3498–9.
**Bengazi** (*bĕn-gä'zē*), seaport of Tripoli; pop. 35,000; taken by Italians (Oct. 1911) in Turco-Ital. War; **3542.**
**Ben Hur.** Hero of Lew Wallace's novel 'Ben Hur, a Tale of the Christ'.
**Beni-Hassan** (*bā'nē-hä'sän*). Village, Upper Egypt; rock tombs and paintings (about 3000 B.C.).
**Benjamin.** Youngest son of Jacob and Rachel, and ancestor of the tribe of Benjamin (Gen. xxxv, 18).
**Benjamin, Judah P.** (1811–84). Amer. lawyer, b. Saint Croix, W. Indies; Confederate politician, atty.-gen. and sec. of war 1861, sec. of state 1862–65; one of ablest members of Davis' cabinet.
**Ben Lo'mond,** mt. (3192 ft.) in n.w. of Stirlingshire, Scotland, on shore of Loch Lomond, **3146.**
**Bennet.** In Jane Austen's 'Pride and Prejudice', middle-class Eng. family, including charming Elizabeth Bennet, the heroine, and her silly mother and sisters.
**Bennett, Arnold** (born 1867), Eng. novelist ('The Old Wives' Tale'; 'Clayhanger'; 'Hilda Lessways'), **2541, 1158, 1167.**
**Bennett, Henry Holcomb** (1863–1912), Amer. writer; poem, 'The Flag Goes By', **1288.**
**Bennett, James Gordon** (1795–1872). Amer. journalist, b. Scotland; originated detailed reporting of public events, practice of interviewing, use of telegraph in reporting, and system of distribution by carriers, making the *Herald,* started 1835, one of the most valuable newspaper properties in the country.
**Bennett, James Gordon, Jr.** (1841–1918), editor and proprietor *New York Herald,* b. New York City; sends Stanley to Africa, **3338.**
**Bennett, Lake,** Yukon, Canada, **3835.**
**Ben Ne'vis,** highest peak in Scotland (4406 ft.), **3146,** *map,* **1159,** *picture,* **3147.**
**Bennington,** Vt., village 30 mi. n.e. of Troy, N.Y.; pop. 7230; textiles; 2000 Green Mountain Boys under Gen. John Stark defeated British under Burgoyne (Aug. 16, 1777), **3003.**
**Ben-nut,** of horseradish tree, **2546.**
**Benson, Arthur C.** (born 1862). Eng. essayist and literary critic, meditative, refined, scholarly ('The Upton Letters'; 'From a College Window'; 'Beside Still Waters'; lives of Rossetti, Pater, Ruskin).
**Benson, Edward F.** (born 1867). Eng. novelist ('Dodo'; 'The Challoners'; 'The House of Defense'; 'The Weaker Vessel'; 'Dodo the Second').
**Benson, Edward White** (1829–96). Eng. churchman, archbishop of Canterbury; father of Arthur C., Edward F., Robert Hugh.
**Benson, Frank Weston** (born 1862). Amer. painter and etcher; portraits of women and children in bright out-door settings; etchings of wild ducks.
**Benson, Robert Hugh** (1871–1914). Rom. Cath. priest; wrote much on religious subjects and several novels ('The Light Invisible'; 'Christ in the Church'; 'Come Rack! Come Rope'; 'An Average Man').
**Benson, William Shepherd** (born 1855). Admiral, U.S.N.; graduated U.S. Naval Academy; chief of naval operations 1915–19; served on commissions abroad during World War and Amer. Commission to Negotiate Peace 1918–19; retired 1919.
**Ben'tham, Jeremy** (1748–1832), Eng. philosopher and jurist; shocked by legal abuses, he surveyed existing institutions to find if they served the greatest good of the greatest number," thus becoming founder of Utilitarian school; **2772.**
**Bentley, Wilson Alwyn** (born 1865), meteorologist, student of snow crystals; b. Jericho, Vt.; **3262.**
**Benton, Thomas Hart** (1782–1858), U.S. senator, **382, 384;** quoted on Zachary Taylor, **3444–5.**
**Benton Harbor,** Mich. One of the world's largest peach markets; across L. Michigan from Chicago; pop. 12,233; ships quantities of other fruit; various mfrs.
**Benue** (*bĕn'wē*) **River,** tributary to Niger, **2507.**
**Benwood,** W. Va., iron and steel mfg. town on Ohio R. just below Wheeling; pop. 4773; **3723.**
**Ben'zene** or **benzol, 384, 814.**
**Ben'zine, 384, 2754, 1207;** in paints, **2642.**
**Ben'zoate of soda, 3271.**
**Benzo'ic acid, 814.**
**Benzoin** (*bĕn'zō-in*), a gum-resin, **2728.**
**Benzol** or **benzene, 384, 814.**
**Beowulf** (*bā'ō-wu̯lf*), hero of early Anglo-Saxon epic poem which bears his name, **384, 1163.**
**Béranger** (*bā-rän-zhā'*), **Pierre Jean de** (1780–1857). Fr. song-writer, poet of the people, and political satirist.
**Berbers** (*bĕr'bĕrz*), anc. white race of n. Africa; includes Kabyles and Tuaregs; gave name to Barbary states; **2323, 37;** Algeria, **96, 97;** Morocco, **2328;** Sahara, **3105, 3106;** Tripoli, **3542** Tunis, **3549–50.**
**Berchtold** (*bĕrĸ'tōlt'*), **Leopold, Count von** (born 1863). Austro-Hungarian statesman who, as ambassador to Russia and foreign minister (1912–15), vainly strove to further Austria's interests in the Balkans; in 1914 he favored war with Serbia and tried to secure new allies for Central Powers.
**Berdichef** (*bĕr-dē-chĕf'*), Ukraine. Market town 100 mi. s.w. of Kiëf; pop. 79,000; famous fairs; scene of many conflicts between Poles and Russians.
**Bere'a College,** at Berea, Ky., founded 1855; co-ed.; industrial, normal, collegiate courses; music; famous for extension work; **1919.**
**Ber'esford, Charles William,** first **Baron** (1846–1919). Eng. admiral, member of Parliament, and author; leader of "big navy" party.
**Beresford, J. D.** (born 1873). Eng. novelist ('Jacob Stahl'; 'The Hampdenshire Wonder').
**Bergamo** (*bĕr'gä-mō*), Italy, Picturesque town 30 mi. n.e. of Milan; pop. 59,000; notable old churches; silk and other textiles.
**Ber'gamot, 2257, 2728.**
**Bergamot oil,** from citrus, **2590;** from mint, **2257.**
**Bergen** (*bĕr'gĕn*), Norway, chief port on s.w. coast; pop. 91,000; exports fish and fish products; shipbuilding; **2532,** *picture,* **2535.**
**Bergen-op-Zoom** (*bĕr'gĕn-ŏp-zōm*), Holland. Old town on Zoom 20 mi. n. of Antwerp; pop. 15,000; famous as scene of many sieges.
**Bergerac** (*bĕr-zhĕ-räk'*), **Cyrano de** (1619–55). Fr. novelist, dramatist, and reckless duelist; subject of Rostand's drama 'Cyrano de Bergerac'.
**Bergh** (*bĕrg*), **Henry** (1820–88). Amer. philanthropist and author, b. New York City; founder (1866) and first president of the American Society for Prevention of Cruelty to Animals.
**Bergson** (*bĕrg-sôn'*), **Henri** (born 1859), Fr. philosopher who denies claim of science to explain universe on mechanical principles ('Time and Free Will'; 'Matter and Memory'; 'Creative Evolution'; 'Laughter'); **1892.**
**Beri-beri** (*bĕr'i-bĕr'i*), nervous disease resulting in paralysis, dropsy, and frequently death, **3651, 3652, 1450, 3015.**
**Bering** (*bē'ring*) or **Behring, Vitus** (1680–1741), Danish navigator, commissioned by Peter the Great to explore n.e. Asiatic coasts for Russia; discoverer of Bering Strait and Alaska; **384, 2860;** Alaskan route, *picture-map,* **75.**
**Bering Sea,** arm of N. Pacific Ocean between Alaska and Siberia, **384–5, 2619,** *maps,* **79, 2624–5, 232–3;** seals, **3167–8;** seal fisheries arbitration, **3168, 1593.**
**Bering Strait,** channel separating Asia and N. Amer. and connecting N. Pacific with Arctic Ocean, **384, 227, 228,** *map,* **2514–5;** route of Asiatic migration to N. Amer., **2514.**
**Berkeley** (*bĕrk'lĭ*), **George** (1685–1753). Eng. idealistic philosopher who maintained that matter has no existence independent of mind; political economist, writer, and Anglican bishop.
**Berkeley, John, Baron of Stratton** (d. 1678), grantee of New Jersey, **2461.**
**Berkeley, Sir William** (1608–77), tyrannical and extortionate Eng. gov. of Va.; suppresses Bacon's Rebellion, **301;** on education, **1084.**
**Berkeley,** Calif., residential suburb of San Francisco on e. shore of San Francisco Bay, opposite Golden Gate; pop. 50,036; state univ., **580.**
**Berkeley Springs,** W. Va., **3720.**
**Berk'shire.** Agricultural county in s. England, s. of Thames R.; 722 sq. mi.; pop. 295,000; county seat Reading.
**Berkshire Hills,** Mass., **2168,** *map,* **2166.**
**Berkshire hog, 1671,** *picture,* **1670.**
**Berlichingen** (*bĕr'liĸ-ing-ĕn*), **Götz von** (1480–1562), "Götz with the iron hand." Ger. feudal knight and soldier of fortune; subject of drama by Goethe.
**Berlin** (*bĕr-lĭn'*). cap. of Germany; pop. about 1,900,000; **385–6, 1440, 2928.**
**Berlin,** N.H. On Androscoggin R. surrounded by rugged mountains; pop. 16,104; abundant water-power for mfrs.; paper, pulp, lumber.
**Berlin, Congress of** (1878), **3560, 310;** Bosnia and Herzegovina, **468;** Disraeli, **1013;** Serbia, independent, **3177.**
**Berlin, University of, 386, 832.**
**Berlin Conference** (1884), **40.**
**Berlin Decree.** Issued by Napoleon, Nov. 12, 1806, beginning of "Continental System."
**Berlin-to-Bagdad Railroad, 304, 2201, 233, 1449.**
**Berlioz** (*bĕr-lē-ōz'*), **Hector** (1803–69), Fr. musical composer, brilliant romanticist, father of modern orchestration; chief works, **2380;** and Liszt, **2026.**
**Bermu'da lily, 2008, 2009,** *picture,* **1306.**
**Bermuda onion, 2581.**
**Bermudas,** group of isls. in Atlantic Ocean; 19 sq. mi.; pop. 22,000; **386,** *map,* **2514–5.**
**Bermudez** (*bĕr-mu̯'thās*), **Juan, 386.**
**Bermudez** (*bĕr-mu̯'dēs*), state in n. Venezuela, between Orinoco R. and Caribbean Sea; asphalt, **3622.**
**Bern** (*bĕrn*), cap. of Switzerland; pop. 112,000; **386–7, 3416.**
**Bernadotte** (*bĕr-nà-dŏt'*), **Jean Baptiste Jules** (1764–1844), Fr. general; elected crown prince of Sweden, **3404.** Ruled as King Charles XIV (1818–44).
**Bernard** (*bĕr-närd'*), **Claude** (1813–78). Fr. physiologist, discoverer of digestive work of pancreatic juice, sugar-forming work of liver,

and existence of vasomotor and vasoconstrictor nerves.

**Bernard, Saint,** of Clairvaux (1090–1153), Fr. monk, one of most illustrious and eloquent preachers of Middle Ages; opposes Abelard, **2**; preaches 2d Crusade, **930,** *picture,* **931**; quoted on slander, **3247.**

**Bernese' Oberland** or **Alps,** dist. in Switzerland, **3413, 3012, 386,** *pictures,* **102, 3414.**

**Bernhardi** (*bĕrn-här'dē*), **Friedrich von** (born 1849), Ger. general and author ('Germany and the Next War'; 'World Power or Downfall'); **3790.**

**Bernhardt** (*bĕrn'härt*), **Sarah** (born 1845), Fr. actress ('Fédora'; 'La Tosca'; 'Cléopâtre'); **1048, 1892;** in 'L'Aiglon', *picture,* **1037.**

**Bernina** (*bĕr-nē'nä*). **Piz,** Alpine peak in s.e. Switzerland, near Ital. border (13,295 ft.); *picture,* **1189.**

**Bernstein** (*bĕrn'stīn*), **Eduard** (born 1850). Ger. Socialist; member of Reichstag 1901–07 and 1912–18; following revolution was sec. of state for treasury till 1919; leader of conservative wing of Socialists.

**Bernstein, Henri** (born 1876). Fr. dramatist ('The Thief'; 'The Claw').

**Bernstorff** (*bĕrn'stôrf*), **J. H., Count von** (born 1862), Ger. ambassador to U.S. (1908–17), **3800.**

**Berry, 1379.** *See also in Index* **Blueberry,** etc.

**Bersaglieri** (*bĕr-sä-lyä'rē*). Corps of Ital. sharpshooters, noted for endurance and rapid marching; wear distinctive uniform and cocks' feathers in their hats.

**Berseem' clover, 810.**

**Bertha** or **Berthrada** (d. 783). Mother of Charlemagne; celebrated in medieval poems and legends; called "Bertha with the large foot" because one of her feet was larger than the other.

**Berthelot** (*bĕr-tĕ-lō'*), **P. E. Marcellin** (1827–1907). Fr. chemist, founded synthetic chemistry and thermochemistry; proved that organic compounds may be produced outside of living bodies.

**Berthollet** (*bĕr-tō-lā'*), **Claude Louis, Count** (1748–1822). Fr. chemist; first physical chemist; with Lavoisier contributed to modern chemical nomenclature.

**Bertillon** (*bĕr-tē-yôn'*), **Alphonse** (1853–1914), Fr. anthropologist; system of measurements for identifying criminals, **1247.**

**Berwick,** Pa. Borough on Susquehanna R. 23 mi. s.w. of Wilkes-Barre; pop. 12,181; cars, iron products, silks, flour.

**Berwick-upon-Tweed,** England. Frontier town at mouth of Tweed R. on Scotch border; pop. 13,000; prominent in border wars.

**Ber'wyn,** Ill. Residential suburb 10 mi. w. of Chicago; pop. 14,150.

**Ber'yl,** a precious stone, **1410.**

**Beryl'lium,** chemical element, **4042.**

**Bérylune, Fairy,** in Maeterlinck's 'Blue Bird', **2112–5.**

**Berzelius** (*bĕr-zē'lĭ-ŭs*), **Jöns Jakob, Baron** (1779–1848), Swedish chemist, discovered selenium, thorium, and other elements; inventor of chemical symbols; determined many atomic weights; **3174.**

**Besançon** (*bĕ-zäṅ-sôṅ'*), France, fortified city on Doubs R. 206 mi. s.e. of Paris; pop. 58,000; watches and clocks; notable Rom. remains; birthplace of Victor Hugo, **1694.**

**Besant** (*bē-zănt'*), **Annie** (born 1847). Eng. theosophist, president Theosophical Society since 1907; prominent in socialist and Indian nationalist movements; founded Central Hindu College 1898 and Central Hindu Girls' School 1904, at Benares.

**Besant, Sir Walter** (1836–1901). Eng. novelist, biographer, critic, and historical writer; collaborated with James Rice; alone wrote 'All Sorts and Conditions of Men', which gave impetus to social reform.

**Besos** (*bā'thŏth*) **River,** Spain, **330.**

**Bessara'bia,** dist. in n.e. Rumania; 17,146 sq. mi.; pop. 2,345,000; former province of Russia; **3080, 3084,** *map,* **308.**

**Bes'sel, Friedrich Wilhelm** (1784–1846), Ger. astronomer and mathematician, **3341, 3342.**

**Bes'semer, Sir Henry** (1813–98), Eng. inventor; Bessemer process of making steel, **1824, 1826;** works at Sheffield, **3200.**

**Bes'semer,** Ala. Iron and steel mfg. city 10 mi. s.w. of Birmingham, in great Ala. coal and iron ore dist.; pop. 18,674.

**Be'ta Centau'ri,** a star, **3342.**

**Beta rays,** of radium, **2960.**

**Betel** (*bē'tl*), nut of an E. Indian palm, **387,** *picture,* **2545.**

**Betelguese** (*bĕt'ĕl-gŭz*), fixed star, **3344;** *charts,* **3343, 873;** size, *picture,* **3342.**

**Beth'any.** Village near Jerusalem often mentioned in Gospels; home of Mary, Martha, and Lazarus; modern village El-Azariyeh.

**Bethany College.** At Lindsborg, Kan.; Lutheran, co-ed.; founded 1881; fine arts, business, law.

**Bethel,** Conn., town 3 mi. s.e. of Danbury; pop. 3201; **1597.**

**Bethel,** Palestine. Village ("House of God") 10 mi. n. of Jerusalem (Gen. xii, 8; xxviii).

**Bethel,** Vt., village 22 mi. n.e. of Rutland, **3633.**

**Bethes'da.** Pool in anc. Jerusalem with miraculous healing qualities.

**Beth'lehem,** Palestine, birthplace of Jesus; pop. 8000; **387, 1887.**

**Bethlehem,** Pa. City 55 mi. n. of Philadelphia on Lehigh R. and Canal; noted for large iron and steel works and annual Bach musical festivals; pop. 50,358; Lehigh Univ., founded by Moravians.

**Bethmann-Hollweg** (*bät-män-hōl'vāĸ*), **Theobald von** (1856–1921), Ger. statesman, imperial chancellor (1909–17), **3790.**

**Bethune** (*bē-thūn'*), **David, Cardinal.** Same as **Beaton.**

**Betulaceae** (*bĕt-yu-lā'sē-ē*), the birch family, including birches, hazels, and alders, **3940.**

**Beuthen** (*boi'tĕn*), Germany. Mining (coal, zinc, calamin) and industrial town in Upper Silesia; pop. 71,000.

**Beveridge, Albert Jeremiah** (born 1862). U. S. Republican senator from Indiana 1899–1911; author of 'The Young Man and the World', 'Life of John Marshall', 'The Bible as Good Reading', 'Americans of Today and Tomorrow'.

**Bev'erly,** Mass. City and summer resort just n. of Salem on Salem Bay; pop. 22,561; shoe machinery and shoes; chief distributing point for Texas oil.

**Bevis** (*bē'vĭs*), **John** (1695–1771), Eng. scientist, **1118.**

**Bewick** (*bū'ĭk*), **Thomas** (1753–1828). Eng. wood engraver; illustrated many books on animals ('Quadrupeds'; 'British Birds'; 'Aesop's Fables').

**Bey** (*bā*), hereditary title of native sovereign of Tunis; also title of nobility throughout Turkish Empire; in Egypt, **1107;** of Tunis, **3550.**

**Beyle** (*bāl*), **Marie Henri.** Same as **Stendhal.**

**Bez'ant.** Gold coin of Byzantine Empire, value about $2.42.

**Beziers** (*bā-zyā'*). Cathedral town and trade center in s. France; pop. 51,000; massacre of Albigenses in 1209.

**Bhagavad Gita** (*bä'gə-väd gē'tə*). A Sanskrit dramatic poem forming part of the Mahabharata.

**Bhils** (*bēlz*), savage dark-skinned race of cent. India, **1748.**

**Bhil'sa,** India, carved gate, *picture,* **1753.**

**Bhutan** (*bu-tän'*), state in e. Himalayas between Tibet and India; 20,000 sq. mi.; pop. 250,000; agriculture, stock raising; **1744,** *map,* **1745.**

**Biafra** (*bē-äf'rə*), **Bight of.** Large bay on w. coast of Africa at head of Gulf of Guinea.

**Bialystok** (*bē-äl'ēs-tŏk*) or **Byelostok** (*bē-ā'lō-stŏk*). Polish city 100 mi. n.e. of Warsaw; pop. 81,000; mfrs. textiles, leather, hats, soap.

**Biarritz** (*bē-ä-rēts'*), France. Watering place on Bay of Biscay near Bayonne; pop. 18,000; summer residence of Napoleon III.

**Bi'as,** Gk. sage, **3275.**

**Bible, 387–91;** Abraham, **2–3;** Apocrypha, **390;** Apostles, **157–8;** Bede's translation, **387;** Caedmon's 'Paraphrases', **563;** Coverdale's translation, **389,** *picture,* **390;** David, **967;** Erasmus' edition of New Testament, **2987, 2996, 390;** Esther, **1179–80;** French translation, **1364;** Gothic translation, **1436, 1491, 390;** Jesus Christ, **1887–8;** Jewish history, **1889–91;** Job, **1894;** King James version, **389, 1860, 1162;** as literature for children, **2027;** Luther's teaching, **2987;** Luther's translation, **1436, 2085;** Mazarin, first book printed from type, **2916, 391;** medieval manuscripts, **456, 390;** Mohammed influenced by, **2275;** Moses, **2333;** New Testament, **388, 157, 1887;** Old Testament, **388, 1624, 1625, 2923;** Paul, **2698;** Peter, **2745;** Prophets, **2922–3;** Psalms, **2376, 967;** riddles in, **3019;** Ruth, **3101–2;** Solomon, **3274;** Tyndale's translation, **389, 1164;** Wyclif's translation, **389, 3817, 1163;** Ximenes' "Complutensian Polyglot," **391, 3824.**

**Bibliothèque Nationale** (*bē-blē-ō-tĕk' nä-siō-näl'*), national library of France, **1992.**

**Bicar'bonate of soda, 3271, 3272;** in baking powders, **305.**

**Bi'ceps muscle, 2372.**

**Bichat** (*bē-shä'*), **M. F. X.** (1771–1802), Fr. anatomist and physiologist, founder of general anatomy; first to show the identity of tissues in all organs of the body; **121.**

**Bichlo'ride of mercury, 2200, 2854;** antidote for, **1270;** as an antiseptic, **151.**

**Bick'erstaff, Isaac.** Pen name of Richard Steele as editor of the *Tatler;* previously used by Swift in his 'Predictions'.

**Bicus'pid teeth, 3452,** *pictures.* **3453.**

**Bicycles and motorcycles, 391.**

**Bid'deford,** Me. Mfg. city and summer resort, 15 mi. s. of Portland and 5 mi. from sea on Saco R.; pop. 18,008; cotton goods, machinery, lumber, shoes; settled in 1630.

**Biela's** (*bē'läz*) **Comet, 850.**

**Bielefeld** (*bē'lĕ-fĕlt*), Germany. Linen mfg. and exporting town in Westphalia, 58 mi. s.w. of Hanover; pop. 80,000.

**Bienne** (*bē-ĕn'*), lake of Switzerland, **3414.**

**Bien'nial plants, 2830;** familiar weed types, **3712.**

**Bienville** (*byăṅ-vēl'*), **Jean Baptiste Lemoyne, Sieur de** (1680–1768), Fr.-Canadian soldier and colonial officer, member of the famous Lemoyne family; founds Mobile, Ala., **73,** New Orleans, La., **2471.**

**Bifocal lens, 3310.**

**Big Belt Mts.,** in cent. Mont., *map,* **2309.**

**"Big Ben," 2054.**

**Big Bend State, 3466.**

**"Big Bertha,"** Ger. siege gun, **634.**

**Big Dipper,** constellation, **239,** *chart,* **873;** Gk. legend, **872.**

**Big'elow, Erastus Brigham** (1814–79), Amer. inventor, **3787, 3080.**

**Bigelow, John** (1817–1911). Amer. journalist and diplomat; managing editor *New York Evening Post* 1849–61; minister to France 1864–67; discovered original manuscript of Benjamin Franklin's 'Autobiography' and edited first complete edition; wrote 'Retrospections of an Active Life'.
**Bighorn,** Rocky Mountain sheep, **392, 3035;** altitude range, *picture,* **397;** allied species, **3198.**
**Big Horn River,** rises in Rocky Mts., in cent. Wyo.; flows 450 mi. n. to Yellowstone R., *maps,* **3820, 2309;** irrigation development, **3820.**
**Bight** (*bīt*), of rope, **1938.**
**'Big'low Papers, The',** series of dialect poems by J. R. Lowell, in which he speaks through imaginary author, Hosea Biglow, shrewd humorous Yankee, **2074.**
**Bigno'nia.** A large genus of twining tendril-bearing shrubs with clusters of trumpet-shaped flowers, found chiefly in tropical America; the cross-vine is only species growing in U.S.
**Big Sandy River,** tributary of Ohio R.; with e. branch (Tug Fork) forms boundary between Ky. and W. Va.; **2573.**
**Big Sioux River,** flows s. (300 mi.) through fertile plains of S. D., forming boundary between Iowa and S. D. for last half of its course; **3294.**
**Big tree,** or sequoia, **3175–6.**
**Bikanir** (*bē-kä'nēr*), India, cap. of native state of Bikanir, Rajputana, 250 mi. s.w. of Delhi; pop. 56,000; **1745.**
**Bilbao** (*bil-bä'ō*). Chief seaport of n. Spain, on Nervion R., 8 mi. from Bay of Biscay; pop. 100,000; exports iron ore from nearby mines; long famous for sword-blades (called "bilbos").
**Bilberry,** a blueberry, **439.**
**Bile, 2031, 1469.**
**Bile duct, 2031, 1469.**
**Bill,** of birds. *See in Index* **Beak.**
**Billiard balls, 392, 1853–4, 672–3.**
**Billiards, 392–3.**
**Billings, Josh.** Pen name of Henry Wheeler Shaw (1818–85), Amer. humorist, b. Lanesborough, Mass., who said, "It's better not to know so many things than to know so many things that ain't so."
**Billings,** Mont., metropolis of stock-raising and agricultural dist., on Yellowstone R. in s.; pop. 15,100; beet-sugar factories, flour mills, brick works; oil wells near by; **2312.**
**Billingsgate.** London's famous fish market, near London Bridge; hence, coarse and abusive language.
**Bill of exchange.** A written order from one person to another directing him to pay to a third person a sum of money which is to be charged to the account of the writer; commonly used for transactions between persons of different countries.
**Bill of lading.** A written acknowledgment of goods received for transportation issued by the master of a ship; acts as a contract to deliver the goods; when issued by a railroad such a bill is called a way bill.
**Bill of rights,** in England, **393;** in U.S. Constitution, **1638, 3594;** in state constitutions, **3346.**
**Bill of sale.** A formal written statement of the sale of personal property; necessary when the transfer of the property does not occur at once.
**Bilox'i,** Miss., popular resort and important market for sea foods on Biloxi Bay, Gulf of Mexico; pop. 10,937; canned fish, fruit, and vegetables; settled in 1699 by Iberville; **2264.**
**Bimet'alism, 2281–2.** *See also in Index* **Silver, free coinage of.**
**Binder twine,** sisal, **3244.**
**Bindings,** book, **458,** *pictures,* **462–3.**
**Bindweeds.** Various plants of the genus *Convolvulus,* named from their tendency to twine so closely about other plants as to kill them; include field bindweed and wild morning glory.
**Binet** (*bē-nā'*), **Alfred** (1857–1911), Fr. psychologist, **2931, 1793.**
**Binet-Simon tests, 1793.**
**Bingen** (*bing'ĕn*), Germany, picturesque old town on Rhine 15 mi. w. of Mainz; pop. 10,000; Mouse Tower, **3005,** *picture,* **1446.**
**Bingham** (*bing'ăm*) **Canyon** or **Bingham,** Utah, mining town 20 mi. s.w. of Salt Lake City; pop. 2676; famous copper mine, **3610, 3612, 882,** *picture,* **3611.**
**Bing'hamton,** N.Y., industrial city on Susquehanna and Chenango rivers 66 mi. s.e. of Syracuse; pop. 66,800; chairs, shoes, cigars, cameras, pottery, machinery; **2485.**
**Binh-Dinh** (*bin'din*), largest town in Anam, Fr. Indo-China, near e. coast; pop. 75,000; **1777.**
**Bin'nacle,** a compass casing, **854,** *picture,* **2420.**
**Binns, Jack, 2146.**
**Binoc'ulars,** field glasses, **3463, 3354.**
**Bino'mial,** in algebra, **95.**
**Binomial theorem, 92.**
**Biochem'istry, 3935.**
**Biog'raphy,** inspirational value of, **2028.**
**Biol'ogy, 393–9, 3144,** *Study Outline,* **3935–52;** anatomy and morphology, **121, 473–5;** animal kingdom, **126–31;** animals distinguished from plants, **393, 2822, 127, 3251;** botany, **473–5;** cells as life units, **671–2, 394, 398, 1641–2,** *picture,* **395;** chemistry of life processes, **394, 714, 3693–4, 1173, 2824, 1010–11;** ecology, **1076;** embryology, **1140–1, 396;** evolution, **1208–11, 963–5;** heredity, **1641–4, 1187, 398;** origin of life, **1062, 1209, 1418, 396, 398;** parasites, **2677–80;** plant life, **2820–31;** prehistoric animals, **132–8;** protoplasm, **394, 398, 2926;** zoölogy, **3841.** *See also in Index* **Reproduction** and chief subjects listed above.
**Bi'on,** Gk. pastoral poet, **1538.**
**Bi'plane,** airplane with two supporting planes, **58.**
**Birch, 399;** autumn coloration, **3537;** catkins and seeds, **3534;** classified, **3533;** found farthest north of all trees, **3533;** leaf, **3536;** stripping bark, *picture,* **442.**
**Birch family** (*Betulaceae*), includes alder, **85,** birch, **399,** hazel, **1611.**
**Bird houses, 423–4,** *pictures,* **424, 425.**
**Bird lice, 1788.**
**Bird reservations, 426, 2709, 3364.**
**Birds, 400–26,** *Study Outline,* **3949–50;** archaeopteryx, earliest known type, **138,** *picture,* **401;** classification, **412;** coloration, **411, 2924;** eggs and incubation, **1090, 406–8,** *pictures,* **1091;** evolved from reptiles, **130, 1420, 400, 3949,** *diagram,* **128;** feathers, **1228–9, 409–12;** first appear in Jurassic period, **1420;** game, **403;** geographic distribution, **404;** mating, **404, 405;** migration, **2231–2, 404,** *picture-map,* **2234;** molting, **1228, 409–10;** in nature study, **2406–17;** nests, **405–6, 3710;** N. Amer. types, color plates, **413–20;** as pets, **2757, 2758;** skeleton, **3245, 400,** *picture,* **3245;** taxidermy, **3442–3;** lack teeth, **3452;** vertebrate animals, **400, 3634;** vocal organs, **405;** wing, **401,** *picture,* **1572.**—*Stories:* 'Birds' Songs and Houses', **421–6;** 'Jimmy, a Tame Crow', **927–9;** 'Old Abe, the War Eagle', **1055–6;** 'The Pigeon that Won a War Medal', **2806.** *See also in Index* the various birds such as **Auk,** etc.
**Birds, economic value of, 401–2, 424, 426;** finches, **1241;** hawks, **1605–7;** nighthawks and whippoorwills, **2508;** owls, **2606–7;** sparrows, **3308;** suppress potato-bugs, **2902;** swallows, swifts, and martins, **3398;** titmouse, **3505;** warblers, **3669.**
**Bird's-eye maple, 2138.**
**Bird's-nest soup, 3399, 744.**
**Birds of Paradise, 2674, 2676,** color plate, **2676–7.**
**Birds of prey.** *See in Index* **Raptores.**
**Bird-spider, 3325,** *picture,* **3325.**
**"Bird Woman,"** Indian guide, **1989.**
**Bireme** (*bī'rēm*), ship, **3207.**
**Biret'ta.** Square cap worn by Rom. Cath. clergy; white for pope, red for cardinal, purple for bishop, black for others.
**Birger** (*bir'gĕr*), **Jarl of Bjälbo** (d. 1266). Regent of Sweden 1250–66; built Stockholm; conquered Finland.
**Bir'kenhead,** England. Seaport and shipbuilding center on Mersey R. opposite Liverpool; pop. 140,000.
**Bir'mingham, George A.** Pen name of Canon James Owen Hannay (born 1865), Irish clergyman and novelist ('The Seething Pot'; 'Spanish Gold'; 'Gossamer'; 'The Island of Mystery').
**Birmingham,** Ala., chief city of the state; pop. 178,806; "Pittsburgh of the South"; **426–7, 70.**
**Birmingham,** England, 113 mi. n.w. of London; pop. 860,000; **427;** metal mfg. center, **1158;** steel pens, **2710.**
**Birney, James G.** (1792–1857). Amer. reformer, b. Danville, Ky.; leader of moderate abolitionists; Liberty party candidate for pres. 1840 and 1844.
**Bir'rell, Augustine** (born 1850). Eng. essayist and political leader; chief secretary for Ireland 1907–16 ('Obiter Dicta'; 'Men, Women, and Books'; critical biographies of Charlotte Brontë, William Hazlitt, Andrew Marvell).
**Birthday stones, 1409.**
**Bisbee** (*biz'bē*), Ariz., copper-mining and smelting town in s.e. of state; pop. 9205; also gold, silver, and lead mining; **202, 882.**
**Bis'cay, Bay of,** part of Atlantic Ocean w. of France and n. of Spain, **1344, 3299,** *map,* **1196–7.**
**Biscuits, 500.**
**Biscuit ware.** Same as **Bisque.**
**Bisharin** (*bish-ä-rēn'*), African tribe, **37.**
**Bishop,** in Christian Church, **763, 662;** in Brit. Parliament, **2687.**
**Bishop's College, University of.** At Lennoxville, Quebec; co-ed., Church of England; incorporated 1843 (university charter 1853); arts, divinity.
**Bishops' Wars,** in Scotland, **3148–9.**
**Bis'kra,** Algeria, winter resort and important military post in fertile oasis 200 mi. s.e. of Algiers; pop. 11,000; scene of Robert Hichens' novel, 'The Garden of Allah'; *picture,* **2275.**
**Bis'marck, Otto von** (1815–98), Ger. soldier and statesman, **427–8, 1448–9, 2929;** Ems dispatch, **1355;** and William I, **3737;** and William II, **3738.**
**Bismarck,** N.D., cap., on Missouri R.; pop. 7122; wholesale center for w. N.D.; various mfrs.; near by is Ft. Lincoln, last command of Custer; **2525, 1989.**
**'Bismarck',** an ocean liner, **3218.**
**Bismarck Archipelago,** group of isls. n.e. of New Guinea; New Britain (New Pomerania), New Ireland (New Mecklenburg), Admiralty Isls., etc.; **2620, 2623;** acquired by Germany, **1449;** assigned to Australia, **2624.**
**Bismuth** (*biz'mŭth*), chemical element, **428;** alloys, **99.**
**Bi'son,** or "American buffalo," **428–31, 528;** Alberta herd, **83.**
**Bisque** (*bisk*), or biscuit ware, **1026, 2905,** *picture,* **2907.**
**Bis'sing, Moritz von, Baron** (1844–1917). Ger. military gov.-gen. of Belgium (1914–17), during whose

administration Edith Cavell was executed and many Belgians deported.
**Bithynia** (*bĭ-thĭn'ĭ-ȧ*). Anc. country in n.w. Asia Minor on Black Sea.
**Bitlis** (*bĭt-lēs'*). Trade center in Asiatic Turkey, 120 mi. s.e. of Erzerum; pop. 40,000; occupied by Russians (1916) in World War.
**Bitlis River,** Turkey, **3499.**
**Bitolia** (*bĭ-tō'lĭ-ȧ*) or **Bitolj** (*bē-tûl'*). Same as **Monastir.**
**Bitter, Karl** (1867–1915), Amer. sculptor, b. in Austria, **3164.**
**Bitter almonds, oil of, 99, 1225.**
**Bittern,** marsh-bird, **431,** *pictures,* **408, 411, 2411;** protective coloration, **2924.**
**Bitterroot.** N. Amer. plant with a bitter tough edible root, sometimes used as food by the Indians; leaves grow in clusters from the root about a fleshy stalk bearing a single rose-colored flower; state flower of Montana.
**Bitter Root Mts.,** range of Rocky Mts., along boundary between Idaho and Mont., **1725, 3036.**
**Bitter Root River,** tributary of Columbia in w. Mont. (110 mi.), flowing n. into Clark Fork, **2310.**
**Bitter sage, 3104.**
**Bittersweet,** Amer. tree-like vine, **431–2, 2509, 2854.**
**Bitu'men, 2750;** asphalt, **234–5.**
**Bitu'minous coal, 812.**
**Bituminous sands, 610.**
**Bi'valve,** mollusk with two-piece shell, **2280, 3201;** clams and mussels, **782–3;** oysters, **2612–6;** rank among animals, *diagram,* **128;** scallop, **3133–4.**
**Bizet** (*bē-zā'*), **Georges** (1838–75), Fr. musical composer; chief works, **2380, 2584.**
**Björnson, Björnstjerne** (*byĕrnst'yĕrnā byĕrn'sŏn*) (1832–1910), Norwegian novelist and dramatist. **432, 3134.**
**Black, Joseph** (1728–99). Scotch chemist and physicist; discovered latent and specific heat.
**Black, William** (1841–98). Scotch novelist ('Strange Adventures of a Phaeton'; 'A Princess of Thule').
**Black,** a color, **837;** paints, **2642.**
**Black aloe,** a tree, **3251.**
**Black and Tans.** Nickname of Royal Irish Constabulary, formerly the military police of Ireland.
**Black ash,** calcium sulphide, **3272.**
**Blackball, 320–1.**
**Black belt,** in U.S., **3588, 72.**
**Blackberry,** fruit-bearing shrub, **432;** how to tell from raspberry, **2977.**
**Blackbird, 432–3;** length of life, **126;** "red-winged," hatching period, **408,** *picture,* **417;** "rusty," does not molt, **410;** starling, **3345–6.**
**Black bread, 3102.**
**Blackbuck,** an Indian antelope, *pictures,* **147.**
**Black'burn,** England. Cotton mfg. city in Lancashire, 24 mi. n.w. of Manchester; pop. 131,000; birthplace of Hargreaves, inventor of spinning jenny.
**Black cherry, 2854.**
**Black Country,** coal-mining and mfg. dist. in Midlands of England between Birmingham and Wolverhampton, **1158, 1160.**
**Black currant, 940.**
**Black Death, 433;** effects, **48, 1700.**
**Black Eagle, Order of, 979.**
**Black earth belt,** in Russia, **3086.**
**Black-eyed Susan,** a daisy-like plant, **953.**
**Black-eye pea,** the cowpea, **910.**
**Blackfeet** or **Blackfoot,** tribe of Plains Indians of Algonquian stock, formerly living about headwaters of Missouri R. and n. to Saskatchewan R., **1767, 1466,** *picture,* **1768.**
**Blackfellows,** of Australia, **261, 266,** *pictures,* **262, 3141.**
**Blackfish,** or grampus, **3723.**
**Blackfish, Alaskan, 2365.**
**Black Forest,** Germany, **433–4;** minerals, **1192;** mountains, **3662;** source of Danube R., **961;** views in, *pictures,* **1448, 1439.**
**Black Friars.** Same as **Dominican Friars.**
**Blackfriars,** 16th cent. theater in London, **3484.**
**"Black Friday,"** financial panic in U.S., **3606.**
**Black frost, 1376.**
**Black gum** or **sour gum.** A popular name for *Nyssa sylvatica,* the pepperidge or tupelo tree of the middle and s. U.S.; height 80 to 90 ft.; wood close-grained and tough, used for wheel-hubs; also, the *Nyssa aquatica,* the swamp-tupelo, whose soft light wood is used for woodenware, crates, etc.
**Black haw.** Same as **Sloe.**
**Black Hawk** (1767–1838), Indian chief, **1772–3, 3444.**
**Black Hawk War, 1772–3, 1736, 3772;** Jefferson Davis, **967;** Lincoln, **2012;** Zachary Taylor, **3444.**
**Blackhead,** in skin, **3246.**
**Black-headed grosbeak,** *picture,* **418.**
**Black-headed gull, 1550,** *pictures,* **1551.**
**Blackheath.** Open common in s.e. London, England; scene of many historic gatherings; rallying place of Wat Tyler and Jack Cade.
**Black hellebore,** or Christmas rose, *picture,* **2852.**
**Black Hills,** in S.D. and Wyo. (Harney Peak 7242 ft.); gold, lead, silver; named from dense pine forests; **3294, 3296–7, 3581.**
**"Black Hole" of Calcutta, 573, 796.**
**Black locust,** a tree, **2045.**
**Black marten, 2156.**
**Black Monks.** Same as **Benedictines.**
**Blackmore, Richard Doddridge** (1825–1900). Eng. novelist ('Lorna Doone').
**Black Mts.,** spur of the Blue Ridge Mts., **158.**
**Blackpool,** England. Popular watering place on Irish Sea, 30 mi. n. of Liverpool; pop. 71,000.
**Black powder,** or gunpowder, **1552–3.**
**Black Prince.** *See in Index* **Edward, the Black Prince.**
**Black race, 2956, 2881, 3867.**
**Black River,** in N.Y. (200 mi.), **2485.**
**Black Rock Desert,** Nev., **3580.**
**Black Sea,** between s.e. Europe and Asia Minor, **434,** *map,* **434;** Bosporus outlet, **468;** receives 4 great rivers, **1188.**
**Blacksnake, 3260.**
**Blackstone, Sir William** (1723–80). Eng. jurist; wrote 'Commentaries on the Laws of England', best-known treatise on Eng. law, for more than 100 years foundation of legal training in England and U.S.
**Black swan, 3400.**
**Blackthorn,** or aloe, **3251.**
**Black walnut, 3667, 3668, 2545.**
**Blackwater,** r. of Ireland, chiefly in Cork County; flows e. and s. 100 mi. to sea at Youghal Bay, **1807.**
**Blackwell, Alice Stone** (born 1857), Amer. journalist, b. East Orange, N.J.; suffrage work, **3778.**
**Blackwell, Elizabeth** (1821–1910). First woman medical graduate in U.S.; founded Infirmary for Women and Children and with her sister, Dr. Emily Blackwell (1826–1910), Woman's Medical College of N.Y. Infirmary.
**Blackwell's Island,** N.Y., **2488.**
**Black willow, 3742, 3743.**
**Blackwood, Algernon** (born 1869), Brit. novelist; especially successful in tales of fantasy and horror; remarkably polished style ('The Centaur'; 'A Prisoner in Fairyland'; 'Day and Night Stories').
**Blackwood,** an acacia, **4.**
**Bladder, 1922.**
**Bladder-nut, 2546.**
**Bladder worms, 3813.**
**Bladderwort,** an insect-eating plant, **2829,** *picture,* **2828.**
**Bla'densburg,** Md. Small town 6 mi. e. of Washington; U.S. troops defeated by British Aug. 1814; once noted dueling ground.
**Blaine, James Gillespie** (1830–93), Amer. statesman; sec. of state 1881, 1889–92; **435, 790, 1399, 1593.**
**Blair, Francis Preston** (1791–1876). Amer. journalist, friend of Jackson and Van Buren, active supporter of Lincoln; father of Francis P., Jr., and Montgomery.
**Blair, Francis P., Jr.** (1821–75). Amer. journalist and soldier, prominent in Missouri politics; helped save state to Union; major-general Union army; U.S. senator 1871–73.
**Blair, Montgomery** (1813–83), Amer. lawyer, b. Franklin County, Ky.; postmaster-general in Lincoln's cabinet; *picture,* **2015.**
**Blake, Edward** (1833–1912). Canadian statesman, premier of Ontario 1871–72, Dominion cabinet member and later Home Rule member of Brit. Parliament.
**Blake, Robert** (1599–1657), Eng. admiral, **435,** *picture,* **1153.**
**Blake, William** (1757–1827), Eng. poet, painter, and engraver; a religious mystic, and highly original genius ('Songs of Innocence'; 'Illustrations for the Book of Job'); **1166;** quoted, **3498.**
**Blakelock, Ralph A.** (1847–1919), Amer. landscape painter, b. New York City; neglected and insane for 20 years before death ('The Pipe Dance'); **2634.**
**Blanc** (*blăn*), **Jean Joseph Louis** (1811–82), Fr. socialist, **3268.**
**Blanc, Cape,** Africa, **3549.**
**Blanc, Mont** ("white mountain"), highest peak of Alps (15,782 ft.), **101, 102, 1345,** *picture,* **1411.**
**Blanca Peak,** Colo., **3036.**
**Blanchard** (*blăn-shär'*), **Jean Pierre** (1753–1809), Fr. aeronaut, first to cross Channel in balloon, *picture,* **311.**
**Blanche of Castile** (1188–1252), Span. princess, queen of Louis VIII of France; regent during minority of Louis IX, **2064.**
**Blanching,** of celery, **671.**
**Blanco** (*blăn'kō*), **Antonio Guzman** (1829–99), Venezuelan dictator 1870–90; made self president by revolution 1870; promoted education and improved economic life; **3622.**
**Blan'cos,** political party of Uruguay, **3609.**
**Bland, Richard Parks** (1835–99). Born near Hartford, Ky.; member House of Representatives 1872–95, 1897–99; leader of Free Silver movement; author of Bland-Allison Act.
**Bland-Allison Act, 1611, 791.**
**Blank verse,** defined, **2851;** Shakespeare's, **3190.**
**Blarney,** village in Ireland, 5 mi. n.w. of Cork; castle contains Blarney Stone; **888,** *picture,* **1810.**
**Blasco Ibañez, Vicente.** *See in Index* **Ibañez, Vicente Blasco.**
**Blash'field, Edwin Howland** (born 1848), Amer. mural painter, b. N.Y. ('Development of Civilization' in Congressional Library); paintings, **322, 3833.**
**Blast furnace, 1820, 1382,** *pictures,* **1817–9.**
**Blasting gelatine,** an explosive, **833;** invented by Nobel, **1050.**
**Blavat'sky, Helena Petrovna** (1831–91). Rus. theosophist; founded Theosophical Society; wrote 'Isis Unveiled'; 'The Key to Theosophy'.
**Bleaching,** of fabrics, **435, 755.**
**Bleeding,** how to stop, **1270.**
**Bleeding heart.** A plant with long racemes of delicate red drooping blossoms; original home is in Asia, but since its introduction into England in 1846 it has been a favorite garden flower there and in America.

**Blefuscud'ians,** in 'Gulliver's Travels', enemies of Lilliputians, **3408.**
**Blende,** or sulphide of zinc, **3840;** crystal, *picture,* **935.**
**Blenheim** (*blĕn'ĭm*), Germany, Bavarian village on Danube, 23 mi. n.w. of Ausburg; battle of, **2150.**
**Blenheim House,** Woodstock, England, **2150.**
**Blennerhas'sett, Harman** (1765–1831). Wealthy Eng. settler in U.S. ruined by connection with Aaron Burr's conspiracy.
**Blennerhassett,** isl. in Ohio R., **2573.**
**Blenny,** a fish, *picture* facing **2553;** eyed, *picture,* **1271.**
**Bleriot** (*blā-rē-ō'*), **Louis** (born 1872), Fr. aviator, **57.**
**Blicher** (*blĭĸ'ĕr*), **Steen Steensen** (1782–1848), Danish lyric poet and novelist, **996.**
**Blights,** various plant diseases, **436;** checked by spraying, **3330–1;** Connecticut chestnuts, **866;** mildews and molds, **2235–6;** pear-leaf, **2701;** rusts and smuts, **3099–3101.**
**'Blimps',** semi-rigid dirigibles, **316.**
**Blind, education of, 436–7,** Helen Keller, **1916;** phonopticon, **2003.**
**Blind fish,** of Mammoth Cave, **665.**
**"Blind spot,"** of the eye, **1213,** *pictures,* **1214, 1216.**
**Blind-worm,** a legless lizard, **2037.**
**Blinker lamps, 3233.**
**Bliss, Tasker H.** (born 1853). General, U.S. Army; graduated U.S. Military Academy 1875; Porto-Rican campaign 1899; chief of staff and commanding general, U.S. Army, 1917; retired Dec. 31, 1917; member Allied Supreme War Council and one of American peace commissioners 1918–19.
**Blister-beetle, 370, 371,** *picture,* **367.**
**Blister rust,** white pine, **3099,** *picture,* **3100.**
**Blisters,** treatment of, **1269.**
**Blizzard, 3751.**
**Bloater,** or smoked herring, **1645, 1190.**
**Block, Adriaen.** Dutch navigator who discovered Housatonic and Connecticut rivers in 1614; Block Island named for him.
**Blockade, 437, 1794, 1974;** in Civil War, **437, 858, 781;** in Napoleonic Wars, **2396, 3670;** in World War, **437, 1140, 3796, 3799, 3094.**
**Block and tackle, 2189.**
**Block Island,** R.I., **3008,** *map,* **3009.**
**Block printing,** method in use before invention of movable type, **456, 2916, 643.**
**Block system,** on railroads, **2970.**
**Bloemfontein** (*blụm'fŏn-tān*), cap. Orange Free State, S. Africa; pop. 27,000; Boer stronghold in S. African War; **2590, 447.**
**Blois** (*blwä*), France. Historic town on Loire, 100 mi. s.w. of Paris; pop. 24,000; splendid castle, once seat of powerful counts of Blois; trade and mfg. center.
**Blonde lace, 1950.**
**Blondel de Nesle** (*blôn-dĕl' dē nāl*), Fr. troubadour, friend and attendant of Richard I, **3016.**
**Blon'din, Charles** (1824–97), Fr. acrobat; real name was Jean François Gravelet; crosses Niagara on tight rope, **2502.**
**Blood, Thomas** (1618?–80), called "Colonel," notorious Irish adventurer, **2050.**
**Blood, 437–8;** alkaline nature, **10;** albumen in, **83;** in birds, **401;** circulation, **438, 1616–7,** *pictures,* **2794–5;** disease germs in, **1450–2, 151–2, 2336–8, 437;** enzymes in, **1173;** in fish, **1274, 3553;** in mammals, **2132, 3166, 3723;** pulse, **2933;** purified by breathing, **2998–9, 438;** withdrawn from brain in sleep, **3251.**
**"Blood and iron," 427.**
**Bloodhound, 1021, 1023,** *picture,* **1023.**
**Blood-poisoning, 150, 152, 1450.**
**Blood pressure.** The pressure of the blood in the arteries; tests of blood pressure are much used in modern medical practice as indications of physical condition; normal adult pressure varies from 100 to 130 mm., increasing with age.
**Bloodroot,** plant with red juice, **438–9;** root structure, **532.**
**Bloodstone, 2945,** March stone, **1409.**
**Blood-vessels, 438.**
**Bloody Assizes, 1861.**
**"Bloody Mary,"** epithet given to Mary I, Queen of England, **2157.**
**Bloody Run, battle of, 3019.**
**Bloomer,** (Mrs.) **Amelia Jenks** (1818–94). Amer. dress reformer and temperance lecturer; gave name to "bloomers."
**Bloomfield,** N.J. Suburban mfg. town adjoining Newark; pop. 22,-019; Newark Theological Seminary.
**Bloomfield Zeisler, Fannie.** *See in Index* **Zeisler.**
**Blooming mill,** *picture,* **1822.**
**Bloomington,** Ill. City 59 mi. n.e. of Springfield in corn belt; pop. 28,725; nurseries, r.r. shops, packing houses; Illinois Wesleyan Univ.
**Bloomington,** Ind., city 46 mi. s.w. of Indianapolis; pop. 11,595; vast quarries of Bedford limestone, furniture factories; seat of state univ.; **1762.**
**'Blot on the 'Scutcheon',** tragedy by Browning, **518.**
**Blougram, Bishop.** In Browning's 'Bishop Blougram's Apology', skeptical, worldly churchman.
**"Blowing the Feather,"** game, **2837.**
**Blow-fly.** Same as **Flesh fly.**
**Blowpipe,** oxy-hydrogen, **1710.**
**Blubber, 3724, 3726,** *picture,* **3726.**
**Blücher** (*blü'ĸĕr*), **Gebhard Leberecht von** (1742–1819), Prussian field marshal, leader of patriot Prussian party during Napoleonic period; his intervention decided Waterloo, **3699, 3700, 3717, 2396.**
**Blue,** a primary color, **837;** place in spectrum, *diagram,* **3311.**
**Blue Andalusian,** a breed of fowls, **2911,** *picture,* **2909.**
**Blueback salmon, 3113.**
**Bluebeard.** Storybook monster who forbids his wife to open a locked door behind which her curiosity discovers the bodies of her murdered predecessors; timely rescue saves her from sharing their fate.
**Bluebell,** flower, **439.**
**Blueberry, 439, 1379;** belongs to heath family, **915.**
**Bluebird, 439;** belongs to thrush family, **3494, 412;** migrations, **2231.**
**'Blue Bird, The',** fairy play by Maeterlinck; story retold, **2112–5.**
**Blue-darter,** or Cooper's hawk, **1605.**
**Bluefield,** W. Va. In s., distributing center for great Pocahontas coal fields; pop. 15,282; r.r. shops, flour mills.
**Bluefields,** Nicaragua, pop. 5000; wireless station; **2505.**
**Bluefish,** described, **1278.**
**Blue grass.** Any of various species of the genus *Poa,* especially the Kentucky blue grass; it has many running rootstocks which form a dense sod, and grows from a few inches to two feet high; less valuable for hay than for pasture and lawn grass; grows especially well in the limestone regions of Kentucky and Tennessee.
**Blue Grass State, 1916.**
**Blue gum,** a eucalyptus, **1187;** in Tasmania, **3438.**
**Blue Hen State, 987.**
**Blue Island,** Ill. Mfg. and commercial city just s. of Chicago city limits; pop. 11,424.
**Bluejay, 440.**
**Blue Knob,** Pa., **2718.**
**Blue Laws.** Any laws designed to regulate the ordinary habits or morals of individuals; particularly, in Connecticut, the strict laws of Puritan days.
**Blue mold,** a fungus, **3828.**
**Blue Mts.,** Australia, **261,** *picture,* **2471.**
**Blue Mts.,** in n.e. Ore.; 8000 to 9000 ft. high; heavily wooded; **2593;** *map,* **2596.**
**Blue** or **Kittatinny Mts., 2457, 2718.**
**Blue Nile,** r. in Africa, rises in Abyssinia, unites with White Nile near Khartum, **2509–10, 4,** *map,* **40–1.**
**Blue-point oyster, 2615.**
**Blue-print, 944, 10.**
**Blue racer,** a snake, **3260.**
**Blue Ridge Mts.,** easternmost range of Appalachian Mts., from Hudson R. s.w. to Ga.; **158;** in Ala., **70;** Ga., **1431;** Md., **2160;** N.C., **2517, 2518;** Pa., **2717, 2718;** S.C., **3290–1;** Tenn., **3465;** Va., **3647–8.**
**Blue shark,** *picture.* **3197.**
**Blue Sky Laws, 3360.**
**Blue vitriol,** copper sulphate, **3390, 881.**
**Blunderbuss,** a gun, **1252, 1256.**
**Blunger,** machine for mixing clay for pottery, **2903.**
**Boabdil** (*bō-ăb-dĭl'*) or **Abu Abdullah,** last Moorish king of Granada (1482–92); conquered and dethroned by Ferdinand; *picture.* **3301.**
**Boa constrictor, 440, 3258,** *picture,* **3259;** eggs, **1090.**
**Boadicea** (*bō-ä-dĭ-sē'ȧ*) (d. 62? A.D.), fierce Brit. warrior queen who vainly resisted Romans; burns London, **2056.**
**Boanerges** (*bō-ȧ-nēr'ġēz*), "sons of thunder," name given by Jesus to the disciples James and John.
**Boar, 440;** Adonis myth, **26;** ancestor of domestic swine, **1670, 1671;** ivory, **1853.**
**Boards of trade, 440–1.**
**Boatman, water,** a bug, **3696,** *picture,* **3698.**
**Boat racing, 444.**
**Boats, 441–6, 3524;** basketwork, **343.** —*Pictures:* canoes of Pacific isls., **2618, 2620, 443;** Chinese sampans, **745;** gondola, **517;** Portuguese sailboat, **2889;** primitive types, **443;** reed boats on L. Titicaca, **448.** *See also in Index* **Ships.**
**Boaz** (*bō'ăz*) (Bible), husband of Ruth, **3102.**
**Bobbin lace,** or pillow lace, **1949.**
**"Bobby,"** nickname for London policeman, **2865.**
**Bobcat, 2087.**
**Bob'olink,** or "rice bird," **446,** *picture,* **418;** migration, **2231, 404;** seasonal plumage change, **1228.**
**Bobwhite,** a game bird, **2943,** *picture,* **414;** eats weed seeds, **402.**
**Boccaccio** (*bōk-kä'chō*), **Giovanni** (1313–75), "father of Italian prose"; author of the 'Decameron', a storehouse of characters and plots used by Chaucer, Shakespeare, Keats and many others; **2996, 1833, 433;** influences Chaucer, **702;** lectures on Dante, **958;** writes in Tuscan dialect, **1832.**
**Boche** (*bôsh*), nickname for Germans, **3248.**
**Bochum** (*bŏĸ'ụm*), Germany. Industrial city in Westphalia, 8 mi. e. of Essen; pop. 143,000; coal mines, iron and steel works.
**Bode** (*bō'dē*), **Johann Ehlert** (1747–1826), Ger. astronomer; Bode's law, **237.**
**Bo'den,** Sweden, town in n. on Lule R. near Lulea, **3404.**
**Bodleian** (*bŏd-lē'ȧn*) **Library,** Oxford, England; public library of the univ., named for Sir Thomas Bodley who restored and reopened it 1602; noted for large collection of manuscripts; *pictures,* **2609, 2810.**
**Boeotia** (*bē-ō'shĭ-ȧ*), dist. of anc. Greece n.w. of Attica, **3485,** *map,* **1518.**
**Boers** (*bụrz*), Dutch farmers of S. Africa; Great Trek and early relations with the British, **3280–2, 446, 3526;** rising during World War, **3254.**
**Boer War** (1899–1902), **446–7;** causes, **3280–2, 446–7, 3011, 3527;** Canada's part, **3369;** leaders, **475, 1930, 3011,**

**3027, 3254**; Lloyd George opposes, **2039**; results, **3282–3, 447, 3254.**
**Boethius** (*bō-ē'thĭ-ŭs*) (about 480–524). Rom. statesman and philosopher ('Consolations of Philosophy', translated by King Alfred and by Chaucer).
**Boettger** (*bĕt'kĕr*), **Jean Frederick** (1681–1719), makes first European porcelain, **2883.**
**Bog,** or swamp, peat in, **2704–5**; "quaking," **2340**; vegetation, **3700.**
**Bogalu'sa,** La., lumber mfg. town on Pearl R. 60 mi. n. of New Orleans; pop. 8245; lumber industry, **2071.**
**Bog moss, 2340, 2704, 3700.**
**Bogotá** (*bō-gō-tä'*), cap. of Colombia, near center; pop. 144,000; **836**; coffee, **824.**
**'Bohème, La'** (*lä bō-ĕm'*), opera, **2584.**
**Bohe'mia,** country in cent. Europe, chief part of Czecho-Slovak Republic; 20,065 sq. mi.; pop. 6,750,000; **447, 270,** *maps,* **271, 947**; glass button industry, **550**; national songs, **2405**; Prague, **2911–2.** *See also in Indcx* **Czecho-Slovak Republic.** —*History:* in Holy Rom. Empire, **1675, 2086**; Huss and Hussite War, **1705**; Thirty Years' War, **3488**; revolt against Austria (1848), **273, 1354**; gains independence, **3807–8.**
**Bohemian Forest** (Böhmerwald), chain of mountains between Bohemia and Bavaria; highest peak Arber; **447.**
**Bohemians, 447, 3250.** *See also in Indcx* **Czechs.**
**Bohemond** (*bō'hĕ-mŏnd*) (1056?–1111), Norman crusader, **929.**
**Boileau** (*bwä-lō'*), **Nicolas** (1636–1711), Fr. poet, satirist, and critic, called "Lawgiver of Parnassus"; chief works, **1365.**
**Boiler,** of steam engine, **3349, 3350**; bismuth in "safety plugs," **428.**
**Boils,** inflammation of the skin and underlying tissue, accompanied by accumulation of pus; often caused by infection with pus germ; due to lack of vitamins, **3652.**
**Bois de Boulogne** (*bwä dē bụ-lō'nyĕ*), Paris, **2682.**
**Boise** (*boi'zē*), Idaho, largest city and cap. in s.w. on Boise R.; pop. 21,393; center of fruit-growing, dairying, stock-raising, and mining dist.; Boise Barracks, govt. horse-breeding station; **1729**; hot springs, **1725**; irrigation project, **1829**; state capitol, *picture.* **1727.**
**Bois-le-Duc** (*bwä-lē-dük'*) or **Hertogenbosch,** Netherlands. City 50 mi. s.e. of Amsterdam; pop. 38,000; noted cathedral; mfg., shipping.
**Bojer** (*bō'yĕr*), **Johan** (born 1872), Norwegian novelist ('The Great Hunger'; 'The Power of a Lie'); **2541, 3134.**
**Bok** (*bŏk*), **Edward William** (born 1863), Amer. journalist, b. in Netherlands; editor *Ladies' Home Journal* 1889–1919.
**Bokhara** (*bō-kä'rà*), khanate of cent. Asia, n. of Afghanistan; 83,000 sq. mi.; pop. 1,250,000; also cap., pop. 75,000; **3555, 3556,** *maps,* **31, 232–3**; rugs, **3079.**
**Bolan** (*bō-län'*) **Pass,** defile 55 mi. long in n. Baluchistan, **1744,** *picture,* **229.**
**Boldrewood, Rolf,** pen name of Thomas A. Browne (1826–1915), Australian novelist ('Robbery under Arms'; 'The Miner's Right'; 'A Tale of the Golden West'), **268.**
**Boleyn** (*bŭl'ĭn*), **Anne** (1507–36), 2d queen of Henry VIII of England, **447, 1636.**
**Bolingbroke** (*bŏl'ing-bruk*), **Henry St. John, Viscount** (1678–1751), Eng. statesman, writer, and intriguer for Stuart restoration in last days of Queen Anne; friend of Pope, **2879.**
**Bol'ivar, Simon** (1783–1830), "the Liberator," S. Amer. general and statesman, **447–8, 2744, 3622, 450.**
**Boliv'ia,** inland country of S. Amer.; cap. La Paz; estimated area 514,000 to 562,000 sq. mi.; pop. 3,000,000; **448–50,** *maps,* **494, 3288–9**; climate, **449, 2973, 3285**; Indian, *picture,* **3287**; minerals, **450, 428, 3289, 3504**; war with Chile, **738.**
**Boll** (*bōl*), seed-capsule of cotton, **901–2.**
**Boll-weevil, 3713, 906,** *picture,* **904.**
**Bologna** (*bō-lō'uyä*), **Giovanni da** (1524–1608), Italianized name of the Fr.–born Jean Boulogne, one of greatest sculptors of Ital. Renaissance, **3158**; 'Flying Mercury', *picture,* **3159.**
**Bologna,** Italy, r.r. center of n. Italy; pop. 190,000; **450.**
**Bologna, University of,** Bologna, Italy, one of oldest European universities; founded 1088; famous for law and medical courses; early admitted women as students and teachers; **450, 831, 832.**
**Bol'shevists,** in Russia, **450–1, 3095–6, 3269, 3798**; counter-revolutions crushed, **3812**; land redistributed, **3088**; leaders, **1986, 3544**; religious policy, **3088**; royal family killed, **2506**; in other countries, **524, 3096, 3808.**
**Bolting,** in flour milling, **1303.**
**Bol'ton** or **Bolton-le-Moors,** England, cotton-mfg. borough in Lancashire 11 mi. n.w. of Manchester; pop. 185,000; **1158**; home of Samuel Crompton, **924.**
**Bo'ma,** Congo State, **860.**
**Bomb,** depth, *picture,* **3796**; hand grenade, **631.**
**Bom'bard,** cannon of early type, **636.**
**Bombardier** (*bŏm-bär-dēr'*) **beetle, 368, 1785,** *picture,* **370.**
**Bombay** (*bŏm-bā'*), 2d city of India on w. coast; pop. 980,000; **451, 1746, 1752**; univ., **1756.**
**Bombay,** a presidency or province of India on w. coast; pop. 19,700,000; 123,059 sq. mi.; **1746, 451**; *map,* **1745.**
**Bom'bidae,** bumblebee family, **364.**
**Bombyc'idae,** family of moths, **3240.**
**Bombycil'lidae,** waxwing family of birds, **412, 3706.**
**Bon** (*bōn*), **Cape,** Africa, on n.e. coast of Tunis, 80 mi. from Sicily, **3549, 2194,** *map,* **40–1.**
**Bo'na,** Algeria. Fortified seaport and commercial and mfg. city; pop. 42,000.
**Bonaparte** (*bō'nà-pärt*), famous Corsican family, **451–2.**
**Bonaparte, Caroline** (d. 1839), sister of Napoleon I; married Murat; **452.**
**Bonaparte, Charles Joseph** (1851–1921), Amer. statesman, b. Baltimore, **452.**
**Bonaparte, Elisa** (1777–1820), sister of Napoleon I, **452.**
**Bonaparte, Jerome** (1784–1860), youngest brother of Napoleon I; king of Westphalia; **452.**
**Bonaparte, Joseph** (1768–1844), eldest brother of Napoleon I; **451**; king of Naples, later of Spain, **2395, 2391.**
**Bonaparte, Louis** (1778–1846), brother of Napoleon I, king of Holland, **451–2, 1901, 2395, 2397, 2442.**
**Bonaparte, Lucien** (1775–1840), Prince of Canino, brother of Napoleon I, **451.**
**Bonaparte, Maria Letizia** (1750–1836), called **Madame Mère** (*mĕr*), mother of Napoleon I, **451.**
**Bonaparte, Napoleon.** *See in Index* **Napoleon I.**
**Bonaparte, Pauline** (1780–1825), sister of Napoleon I, **452.**
**Bonavista** (*bŏn-à-vĭs'tà*). Name of bay, cape, dist., and small fishing town on e. coast of Newfoundland.
**Bond, Sir Robert** (born 1857). Newfoundland statesman; premier 1900–09; leader of Liberal Opposition; retired from public life 1914.
**Bonded warehouse.** Storehouse where goods are held for payment of customs or excise duties.
**Bonds,** interest-bearing securities, **452, 3358–60**; how to figure return on, **2725.**
**Bone, 452–3**; broken, first aid, **1269**; cell form, **672**; contains calcium phosphate, **571**; of ear, **1057,** *pictures,* **1057**; growth affected by parathyroid, **1470**; hollow in birds, **400**; marrow produces red corpuscles, **437**; skeleton, **3244–5**; used as fertilizer, **1235**; in button mfg., **550**; yields gelatin, **1409**; phosphorus, **2777.**
**Bone-black,** or animal charcoal, preparation and uses, **688, 452–3.**
**Bone porcelain, 2883.**
**Bone'set** or **thoroughwort.** A perennial herb of *Compositae* family growing in moist soil; used medicinally in the form of a strong bitter tea brewed from the leaves and flowering tops.
**Bone-tar, 3436.**
**Bonheur** (*bŏn-ûr'*), **Marie Rosalie** (1822–99), Fr. artist, **453–4.**
**Bonhomme Noël** (*bŏn-ŏm' nō-ĕl'*), **759.**
**'Bonhomme Richard'** (*rē-shär'*), ship of John Paul Jones, **1900.**
**Bon'iface,** name borne by nine popes, **454.** For list *see in Index* **Pope.**
**Boniface VIII** (1228?–1303), pope, **454**; struggle with Philip IV, **2762–3.**
**Boniface IX** (d. 1404), pope, **454.**
**Boniface, Saint** (680–754), converted Germans to Christianity, **454.**
**Bonifacio** (*bō-nē-fä'chō*), **Strait of,** between Sardinia and Corsica, **3127, 894.**
**Bonin** (*bō-nēn'*) **Islands,** group of 20 small Japanese isls. in the Pacific 500 mi. e. of mainland of Japan; 27 sq. mi.; **2624.**
**Boni'to,** a fish of the mackerel family, **3553.**
**Bonn** (*bŏn*), Germany, city in w. Germany; pop. 88,000; **454.**
**Bonn, University of.** At Bonn, Germany, founded in 1818 by Frederick William III of Prussia; faculties of law, medicine, philosophy, Rom. Cath. theology, Protestant theology; generally ranked 2d among leading Ger. univs.
**Bonnat** (*bō-nà'*), **Léon** (1833–1922), Fr. portrait painter; Hugo, *picture,* **1694.**
**Bonnet monkey,** or macaque, **2292,** *picture,* **2291.**
**Bonneville** (*bŏn'vĭl*), **Lake, 1515, 3610.**
**Bony labyrinth,** inner ear chamber, **1057.**
**Bookkeeping, 5–7**; aided by calculating machines, **572.**
**Book-lice, 1788, 3946.**
**'Book of Mormon', 2326.**
**'Book of the Dead', 1100.**
**Books and bookmaking, 455–63**; Bibles, **388–91**; binding, **458,** *pictures,* **460–3**; for the blind, **436–7**; for children, **2027–30, 3367–8**; copyrights, **884**; Egypt (anc.), **1100, 1102**; libraries, **1991–3**; manuscripts, **455–6, 390, 3817,** *pictures,* **388, 389, 455, 457, 1889, 1992**; printing, **2916–8, 456**; reading, **2979–82.**
**Bookworm,** a beetle, **370.**
**Boomah-nut** (*bō'mà-nŭt*), **2546.**
**Boom'erang,** curved wooden missile, the weapon of Australian natives, **464,** *picture,* **465.**
**Boone, Daniel** (1734–1820), Amer. hunter and pioneer; explored Ky. and Tenn.; **464, 1920.**
**Boone,** Iowa. Clay-mfg. and coal-mining center 35 mi. n.w. of Des Moines, with extensive agricultural trade; pop. 12,451.
**Boone Lick Trail, 3024.**
**Boonesborough,** Ky., convention (1775), **1920**; founded by Daniel Boone, **464.**
**Boone's Creek, 464.**
**Bootes** (*bō-ō'tēs*). Northern constellation containing the bright star Arcturus; near the Great Bear; name means "the herdsman."

**Booth, Ballington** (born 1859), Amer. religious leader, son of Gen. Booth, b. England; founds Volunteers of America, **3120.**

**Booth, Bramwell** (born 1856). Eng. religious leader, son and successor of William Booth as "general" of Salvation Army.

**Booth, Edwin** (1833–93). Amer. actor, b. Belair, Md.; foremost Amer. tragedian of his day, perhaps not equaled by any successor; played Shakespeare, notably Hamlet, King Lear, Othello.

**Booth, Evangeline.** Eng. religious leader, commander of Salvation Army in U.S., daughter of Gen. William Booth.

**Booth, John Wilkes** (1839–65), Amer. actor, b. Hartford County, Md.; brother of Edwin; assassinates Lincoln, **2014, 780.**

**Booth, Maude Ballington** (born 1865), **3120.**

**Booth, Gen. William** (1829–1912), Eng. minister, author ('In Darkest England and the Way Out', a work offering remedies for pauperism); founds Salvation Army, **3119.**

**Boothbay Harbor,** Me., fish hatchery, *picture,* **1281.**

**Boothby, Guy** (1867–1905), Australian novelist, **268.**

**Boothia** (*bo'thĭ-ȧ*) **Felix,** northernmost peninsula of Amer. mainland; *map,* **602–3;** North Magnetic Pole, **2860.**

**Booth-Tucker, Frederick St. George de L.** (born 1853). Commander of Salvation Army in U.S. (1896–1904), son-in-law of William Booth.

**Bootle,** England. At the mouth of the Mersey; great docks are part of dock system of Liverpool, of which Bootle is practically suburb; pop. 80,000.

**Boots and shoes.** *See in Index* **Shoes.**

**Bopp** (*bŏp*), **Franz** (1791–1867), Ger. philologist, **2771.**

**Bora** (*bō'rä*), **Katharine** (1499–1552), wife of Luther, **2085.**

**Boracic acid.** Same as **Boric acid.**

**Borage,** family of plants, **1620, 3943.**

**Borah** (*bō'rä*), **William Edgar** (born 1865), Amer. politician (Republican), b. Fairfield, Ill.; U.S. senator from Idaho after 1907; in campaign of 1920, **1580.**

**Borax,** sodium biborate, **464;** in Chile, **736;** in Death Valley, Calif., **970, 582.**

**Bordeaux** (*bôr-dō'*), France, port on w. coast; pop. 265,000; **466, 3802–3.**

**Bordeaux, University of.** Established at Bordeaux, France, in 1441; self-governing until reign of Francis I, thereafter under state control; faculties of science, letters, law, medicine, and pharmacy.

**Bordeaux mixture,** poisonous spray, **3331, 2701.**

**Bor'den, Sir Robert Laird** (born 1854), prime minister of Canada, **466–7, 620;** quoted, on Sir Charles Tupper, **3553.**

**Borders, The,** territory on both sides of boundary between England and Scotland; border battles, **3148.**

**Boré, Etienne de,** revolutionizes sugar industry, **2068.**

**Bore,** of firearms, **1254, 635.**

**Bore,** or tidal wave, **3497, 3498, 1574,** *picture,* **3498.**

**Boreas** (*bō'rē-ȧs*), in Gk. myth., god of the north wind, **29.**

**Borer.** *See in Index* **Boring animals.**

**Borer,** a machine tool, **3514,** *picture,* **3516.**

**Borghese,** noble family of Italy; Prince Camillo (1775–1832), **452;** palace, **3057.**

**Borgia** (*bôr'jȧ*) **family,** powerful house of Renaissance Italy, **467.**

**Borgia, Caesar** (1476–1527), **467, 3644, 1902.**

**Borgia, Francis** (1510–72), member of the Span. Borgias; famous Jesuit head, **467.**

**Borgia, Lucretia** (1480 – 1519), Duchess of Ferrara, **467.**

**Bor'glum, Gutzon** (born 1867), Amer. sculptor, b. Idaho, **3164;** statues by, **2448, 3205,** *picture,* **109.**

**Borglum, Solon Hannibal** (1868–1922), Amer. sculptor, brother of Gutzon, b. Ogden, Utah; **3164.**

**Boric acid, 151, 464.**

**Boring animals:** insects, **1787, 1328;** oyster drill, **3256, 2614;** piddock, *picture,* **3202;** sponge, **2614;** teredo, **3201.**

**Boring machines, 3514,** *picture,* **3516.**

**Boris** (*bō'ris*) **III** (born 1894), king of Bulgaria, **533.**

**Boris Gudenof** (*gu̯-dä-nŏf'*) (1551?–1605). Rus. czar; gained throne 1598; while regent, bound peasants as serfs to the soil (1587); died amid uprisings in favor of the first False Demetrius; subject of play by Pushkin, opera by Moussorgsky.

**Borneo** (*bôr'nē-ō*), isl. in Malay Archipelago; 290,000 sq. mi.; pop. 1,850,000; **467–8, 1070,** *maps,* **1072, 2624–5;** orang-utan, **2590;** proboscis monkey, **2292,** *picture,* **2291;** sago, **3104;** superstitions, **1005, 2881.**

**Bornholm** (*bōrn'hōlm*), isl. of Denmark, **996,** *map,* **997.**

**Boro Budor** (*bō'rō bu̯'dŏr*), Buddhist temple, **1879,** *pictures,* **1877, 1878.**

**Borodin** (*bo-rō-dēn'*), **Alexander** (1834–87). Rus. composer ('In Central Asia', for orchestra; 'Prince Igor', opera; symphonies, string quartets, and songs).

**Borodino** (*bŏr-ō-dē'nō*), Russia. Village 70 mi. w. of Moscow; scene of bloody but indecisive battle (1812) between Napoleon and Russians.

**Bo'ron,** chemical element, **4042.**

**Borough** (*bŏr'ō*), an incorporated village, town, or city; of London, **2056;** of New York City, **2498.**

**Borrome'an Islands,** *picture,* **1193.**

**Borromeo** (*bŏr-rō-mā'ō*), **Saint Carlo** (1538–84), cardinal and archbishop of Milan; chief figure in last years of Council of Trent, tomb, **1846.**

**Borrow, George** (1803–81). Eng. traveler, friend of gipsies, author ('The Bible in Spain'; 'Lavengro'; 'The Romany Rye').

**Bors, Sir,** one of knights of Round Table, **3068;** quest for Grail, **1391.**

**Bor'zoi,** a Rus. wolfhound, **1021,** *picture,* **1023.**

**Bos** (*bŏs*), the cattle genus, **663, 527, 3827.**

**Bosna-Serai** (*bŏz'nä-sĕ-rī'*). Same as **Serajevo.**

**Bosnia** (*bŏz'nĭ-ȧ*) **and Herzegovina** (*hĕr-tsā-gō-vē'nä*), part of Jugo-Slavia; 20,000 sq. mi.; pop. 2,000,000; **468, 271–2, 1901,** *maps,* **271, 308;** annexed by Austria, **310, 468, 273;** scene in Serajevo, *picture,* **309.**

**Bosniaks,** people of Bosnia, **468, 3250.**

**Bosporus** (*bŏs'pō-rŭs*) or **Bosphorus,** strait 18 mi. long between Sea of Marmora and Black Sea, **468;** Constantinople on, **871;** control under League of Nations, **3560;** in World War, **3807.**

**Bossuet** (*bō-swā'*), **Jacques Bénigne** (1627–1704), Fr. preacher, called greatest ecclesiastical orator in history, **1364.**

**Boston,** Mass., state cap.; pop. 748,060; **469–73;** airplane view, *picture,* **2169;** Christian Science Mother Church, *picture,* **1081;** early musical center, **2380;** educational center, **472, 473;** fish market, **1283;** foreign population, **473;** government, **2370;** historic interest, **469–73;** juvenile court, **1906;** *Old Ironsides* at Navy Yard, **2423;** Old State House, *picture,* **975;** public library **471, 3127,** *pictures,* **470, 224, 2923.** —*History:* founded, **472, 3757;** first newspapers, **2474;** Boston Massacre, **3001, 472,** *picture,* **3000;** Boston Tea Party, **3001, 16,** *picture,* **3000;** Revere's ride, **2999–3000;** British besiege, **3002,** great fire, **473.**

**Boston ivy, 1854.**

**Boston Massacre, 3001, 472,** *picture,* **3000;** John Adams, **12;** Hancock, **1570.**

**Boston pins,** in bowling, **475.**

**Boston Port Bill,** passed by Brit. Parliament (1774) after "Boston Tea Party"; closed port, removed seat of govt. to Salem, and demanded reparation; one of Coercive Acts, **3001.**

**Boston Tea Party, 3001,** *picture,* **3000;** Samuel Adams, **16;** Paul Revere, **3000.**

**Boston terrier, 1023.**

**Boston University.** At Boston, Mass.; co-ed., Meth. Episc.; chartered 1869; arts, agriculture, theology, law, medicine.

**Boswell** (*bŏz'wĕl*), **James** (1740–95), Scotch author; friend and biographer of Dr. Johnson, **1899–1900, 1166, 2028.**

**Bosworth Field,** in Leicestershire, England, scene of final battle of Wars of Roses (1485), **3017.**

**Botany, 473–5, 393,** *Study Outline,* **3937–43;** anatomy and morphology, **121, 473;** bulbs, tubers, and rootstocks, **532;** classification, **473, 2831;** ecology, **473, 1076;** flowers, **1304–11;** fruits, **1380;** leaves, **1980–2;** Linné's work, **473, 2018,** nature study, **2406–17;** plant life, **2820–31;** reproduction, **1306–11, 394, 1642, 2338–9, 1232–4,** *pictures,* **395, 1643;** roots, **3063;** seeds and spores, **3171–3, 1380;** trees, **3533.** *See also in Index* the chief subjects above.

**Botany Bay,** inlet on e. coast of Australia, 5 mi. s. of Sydney; so named by Cook (1770) because of variety of flora; **266.**

**Bot fly,** fly whose larvae live under the skin of animals, **1313.**

**Botha** (*bō'tä*), **Louis** (1862–1919), Boer leader, later prime minister of Union of S. Africa, **475, 3254, 3796.**

**Both'nia, Gulf of,** arm of Baltic Sea, between Finland and Sweden, **321, 1248, 3401, 3402,** *map,* **2531.**

**Both'well, James Hepburn, Earl of** (1536?–78), powerful Scotch noble; dissolute, picturesque ruffian; 3d husband of Mary, Queen of Scots, **2158.**

**Bo-tree, 3533, 525.**

**Botticelli** (*bŏt-tē-chĕl'lē*), **Sandro** (1444–1510), Florentine painter, with poetic feeling and richly decorative style ('Birth of Venus'; 'Primavera'), **2629.**

**Bottineau** (*bŏt'ĭ-nō*), N.D.; pop. 1172; **2525.**

**Bottles,** blown by machines, **1472;** how corks are made, **887–8.**

**Bottom,** clownish rustic in 'Midsummer Night's Dream'. **2230.**

**Bot'uline,** a poison, **2855.**

**Boucher** (*bu̯-shā'*), **François** (1703–70). Gay, brilliant Fr. painter of Pompadour era, styled "Anacreon of painting."

**Boudinot** (*bu̯'dĭ-nŏt*), **Elias** (1740–1821). Amer. philanthropist and Revolutionary patriot, b. Philadelphia; president of Continental Congress (1782); signer of treaty of peace with Gt. Brit.

**Bougainville** (*bo-găn-vēl'*), **Louis Antoine de** (1729–1811), Fr. navigator, **2623.**

**Bough'ton, George H.** (1834–1905), Eng.-Amer. painter; works by, *pictures,* **1831, 2937.**

**Bouguereau** (*bu̯-gĕ-rō'*), **A.W.** (1825–1905). Fr. painter ('The Birth of Venus').

**Bouillon** (*bu̯-yôn'*). Anc. duchy in the Ardennes; possession of Godfrey de Bouillon, leader of First Crusade; now comprised in Belg. province of Luxemburg.

**Boulanger** (*bu̯-lăn-zhā'*), **Georges E. J. M.** (1837–91). Fr. general, anti-republican popular idol and Royalist plotter; convicted of treason; committed suicide.

**Boulder,** Colo. City 25 mi. n. of Denver at mouth of Boulder Canyon; agricultural, mining, and oil interests; pop. 11,006; noted health and summer resort; state univ.
**Boulogne** (*bụ-lōn'*), or **Boulogne-sur-Mer,** France, fortified seaport on English Channel; pop. 53,000; fishing and commercial center; Rom. lighthouse, **2004.**
**Boulogne-sur-Seine** (*sür-sān'*). Suburb s.w. of Paris; pop. 57,000.
**Boulton, Matthew** (1728–1809), Eng. manufacturer and engineer, **427, 3705.**
**Boundary lines,** how determined, **3397.**
**'Bounty' mutiny, 2624.**
**Boura'o tree,** in Samoa, **3120.**
**Bouras'sa, Henri** (born 1868). Fr.-Canadian journalist and legislator, leader of Canadian Nationalist movement; editor *Le Devoir.*
**Bourbon** (*bụr'bŏn*), **House of,** younger branch of Fr. royal (Capet) family, figuring in history from 9th cent. and occupying various European thrones after 16th cent.; in France, **1637, 2067, 3430, 696;** in Sicily, **3230;** Spain, **3304.**
**Bourbon whisky, 1918.**
**Bouresches** (*bụ-rĕsh'*), France, village near Belleau Wood, **380.**
**'Bourgeois Gentilhomme** (*bụr-zhwä' zhän-tē-yōm'*), **Le',** comedy by Molière, **2380.**
**Bourgeois** (*bûr-ġois'*), **type, 3572.**
**Bourgeoisie** (*bụr-zhwä-zē'*), Fr. term applied to commercial or middle class; "bourgeois" republic, **1356.**
**Bourges** (*bụrzh*). France. Historic city, mfg. and trade center 125 mi. s. of Paris; pop. 46,000; magnificent cathedral; govt. arsenal.
**Bourget** (*bụr-zhā'*), **Paul** (born 1852). Fr. novelist and critic, subtly analytical and psychological ('Sensations d' Italie'; 'Cosmopolis'; 'Outre-Mer'; 'Le Disciple').
**Bourinot** (*bụ-rī-nō'*), **Sir John George** (1837–1902). Canadian historian and writer on political science ('Manual of Constitutional History'; 'Canada under British Rule').
**Bournemouth** (*bōrn'mŭth*), England. Watering place and winter resort 22 mi. s.w. of Southampton; pop. 86,000.
**Bourse** (*bụrs*), in Europe, a stock exchange or money market; Brussels Bourse, *picture,* **376.**
**Bouvines** (*bụ-vēn'*), France, village 7 mi. s.e. of Lille; victory of Philip Augustus over John of England and Otto IV of Germany (1214), **2606.**
**Bovary** (*bō-vä-rē'*), **Emma.** In Flaubert's novel 'Madame Bovary', irresponsible, selfish, extravagant young woman who, involved in debt and 'ntrigue, finally poisons herself.
**Bovidae** (*bŏ'vĭ-dē*), family of hoofed, hollow-horned animals, such as cattle and sheep, **663.**
**Bow,** England, mfg. town in center of Devonshire, potteries, **2883.**
**Bow and arrow,** Amer. Indian types, *pictures,* **1771;** Assyrian, *picture,* **296;** in medieval warfare, **1935, 214, 1700, 1699, 42;** invention a step in civilization, **771;** Stone Age arrow heads, *pictures,* **3361;** yew bows, **3830.**
**Bowdoin** (*bō'dn*), **James** (1726–90). Amer. statesman, b. Boston; gov. of Mass. 1785–87; suppressed Shays' Rebellion; Bowdoin College named for him.
**Bowdoin College,** at Brunswick, Me.; men; incorporated 1794; arts and letters, medicine; **1607,** *picture,* **2128.**
**Bow'ell, Sir Mackenzie** (1823–1917). Canadian statesman, premier 1894–96, Conservative leader in senate 1896–1906.
**Bower bird,** of Australia, **405.**
**Bowery,** New York City, **2494.**
**Bowfin** (*bō'fĭn*), a mudfish, **2365.**
**Bowie** (*bō'ĭ*), **Col. James** (1796–1836), Amer. pioneer and soldier, **3478.**
**Bowlders,** left by glaciers, **1721.**
**Bowles, Samuel** (1826–78). Amer. journalist, editor *Springfield Republican,* which was founded by his father.
**Bowline** (*bō'lĭn*), a knot, **1938.**
**Bowling,** Amer. indoor game, **475–6;** in cricket, **919.**
**Bowling Green,** Ky. City 100 mi. s.w. of Louisville; pop. 9638; several educational institutions; trade in horses, mules, and hogs; strategic point during Civil War.
**Bowls,** Eng. game, **475.**
**Bow River,** Alberta, **575.**
**Bowsprit** (*bō'sprĭt*), of ship, **3209.**
**Box'berry,** or wintergreen, **3752.**
**Box calf leather, 1976, 1977.**
**Boxer Rebellion,** in China (1900), **748;** and U.S., **2104, 2708,** *picture,* **3603.**
**Boxing, 476,** *pictures,* **477.**
**Box kite,** how to make, **1930.**
**Box score,** in baseball, **340.**
**Box tortoise, 3562.**
**Boxwood,** used for hedges, **1628;** in wood engraving, **1168.**
**Boy'cott, Charles C.** (1832–97), agent for Irish estates, driven out of Ireland (1880) through "boycotting," **476.**
**Boycott, 476, 2689.**
**Boyesen** (*boy'ĕ-sĕn*), **Hjalmar Hjorth** (1848–95). Amer. novelist and critic, b. Norway ('Gunnar'; 'Ilka on the Hilltop').
**Boyle, John J.** (1851–1917), Amer. sculptor, b. New York City ('The Stone Age'; 'The Alarm'; 'The Savage Age'); **3164.**
**Boyle, Robert** (1627–91), Eng. scientist; formulated Boyle's law, **1403, 2787;** discoveries in electricity, **1117.**
**Boyle's law,** in physics, **1403.**
**Boyne** (*boin*) **River,** in e. Ireland flowing into Irish Sea, **1807;** battle of (1690), **1810, 1861.**
**Boy Scouts of America, 478–86;** camping, **594;** canoeing, *picture,* **442;** first aid, **1266;** signal codes, **3233,** *picture,* **3232.**
**Boz** (*bŏz*). Pen name sometimes used by Charles Dickens.
**Bozeman** (*bōz'man*), Mont., farming center 75 mi. s.e. of Butte; pop. 6200; college, **2312.**
**Bo'zen** or **Bot'zen,** town in the Italian Tyrol; Castle Runkelstein, *picture,* **270.**
**Bozzaris** (*bŏt'sä-rēs* or *bō-zăr'ĭs*), **Marcos** (1788?–1823). The "Leonidas of modern Greece," hero of Gk. war of independence; killed at Missolonghi, as told in Fitz-Greene Halleck's poem 'Marco Bozzaris'.
**'Brabançonne'** (*brä-bäṅ-sŏn'*), Belg. national air, **2405.**
**Brabant** (*brä'bănt*). Medieval duchy of Netherlands; now divided into N. Brabant (Netherlands) and Antwerp and S. Brabant (Belgium).
**Brachiopod** (*brăk'ĭ-ō-pŏd*), or lampshell, **3814, 3201, 3813;** evolutionary position, *diagram,* **128;** fossils, **1418.**
**Brachycephalic** (*brăk-ĭ-sĕf-ăl'ĭk*), "short-headed," term in anthropology, **2956.**
**Brack'en,** a type of fern, **1234,** *picture,* **1232.**
**Bract,** a modified leaf which protects or supports a bud or flower; in flower classification, **3939;** tulip tree, **3548.**
**Brad'dock, Edward** (1695?–1755), Brit. general, defeated and slain during French and Indian War, **1362, 3676, 464.**
**Braddock,** Pa. Steel mfg. borough on Monongahela R. 10 mi. s.e. of Pittsburgh; pop. 20,879; scene of Braddock's defeat.
**Bradford, William** (1590–1657), *Mayflower* pilgrim, 2d gov. of Plymouth Colony, **2841;** and Roger Williams, **3742;** writings, **111, 2175, 2176.**
**Bradford,** England, city in Yorkshire, 30 mi. n.e. of Manchester; pop. 295,000; famous woolen mills, **1160.**
**Bradford,** Pa. Industrial and r.r. city 65 mi. s. of Buffalo, N.Y.; in oil and natural gas fields; pop. 15,525.
**Brady, Cyrus Townsend** (1861–1920). Amer. clergyman and author, b. Allegheny, Pa. ('American Fights and Fighters'; 'Under Tops'ls and Tents').
**Braga** (*brä'gä*), **Theophilo** (born 1843). Port. reformer, provisional pres. of the republic 1910–11, scholar and author.
**Braga,** Portugal. City 33 mi. n.e. of Oporto; pop. 25,000; Rom. ruins and medieval churches.
**Braganza** or **Bragança** (*brä-gän'sä*), **House of.** The reigning family of Portugal 1640–1910, and of Brazil 1822–89.
**Bragg, Braxton** (1817–76), Confederate general, b. Warren County, N.C.; defeated Rosecrans at Chickamauga (Sept. 19–20, 1863); defeated by Grant at Chattanooga (Nov. 23–25, 1863); at Missionary Ridge, **700–1;** at Stone R., **1361.**
**Bragg, Edward Stuyvesant** (1827–1912). Amer. politician and congressman, b. Unadilla, N.Y.; brigadier-general in Civil War.
**Bragi** (*brä'gē*), god of poetry in Norse myth., **3135–6.**
**Brahe** (*brä'hĕ*), **Tycho** (1546–1601), early Danish astronomer; created a new epoch in astronomy by his improvements in astronomical observation; and Kepler, **1920.**
**Brahma** (*brä'mȧ*), Hindu god, **486, 1651.**
**Brahma,** a breed of fowls, **2911,** *picture,* **2909.**
**Brah'manas, 1755, 1651.**
**Brah'manism, 1651, 1752.**
**Brahmans,** priestly caste of Hindus, **1651, 1750;** costume, *picture,* **1752.**
**Brahmaputra** (*brä-mä-pụ'trä*) **River,** India; rises in Tibet and flows e. 800 mi., then bending s. breaks through the Himalayas and flows s.w. to Ganges 1800 mi.; **3495, 1745,** *map,* **1744.**
**Brahms** (*brämz*), **Johannes** (1833–97), Ger. pianist and composer, called the last of the great classical masters; ranked by many with Bach and Beethoven; chief works, **2380.**
**Braila** (*brä-ē'lä*), also **Brailov** (*brä-ē'lôf*) and **Ibrail** (*ē-brä-ēl'*), Rumania, important Danube port 160 mi. n.e. of Bucharest; pop. 65,000; former Turkish fortress; seized by Germans 1916; sulphur springs; **962, 3082.**
**Braille** (*brȧ'y*), **Louis** (1809–52), Fr. educator and organist, inventor of Braille (*brāl*) system of printing for the blind, **436, 437.**
**Brain, 486–92;** cells, **486, 488;** convolutions, **490;** divisions of, **491;** evolution, **486;** in hypnosis, **1718;** injuries and diseases, **491–2;** of Java "ape-man," **2133;** man's compared with ape's. **153–4;** and nerves, **490, 2436–7;** phrenology, **2784;** in prehistoric animals, **1336;** psychology, **2930–1;** seat of mind, **2247;** and senses, **488, 1213–4, 1057, 3440;** sleep and dreams, **3250–1.** *See also in Index* **Psychology.**
**Brainerd, David** (1718–47). Early missionary to the Indians of Mass., Del., and e. Pa.; b. Haddam, Conn.; life written by Jonathan Edwards.
**Brainerd,** Minn., city in cent. portion on Mississippi R. 110 mi. n.w. of St. Paul; pop. 9591; large r.r. shops, lumber and flour mills; in Cuvuna iron range; power dam, **2268.**

**Brain'tree,** Mass. Town 10 mi. s. of Boston; granite-quarrying, metal-working; pop. 10,580; settled in 1634 and figured in colonial history.
**Brake,** a type of fern, **1234.**
**Brakes, 492–3;** automobile, **278, 287.**
**Bra'mah lock, 2042.**
**Bramante** (*brä-män'tā*), **Donato** (1444–1514), Ital. Renaissance architect, employed by Pope Julius II to reconstruct Vatican and St. Peter's; **2997.**
**Bramble,** or blackberry, **432.**
**Bran,** husk of wheat grains, **1302;** corn, **890;** food value, **1321.**
**Brand,** peasant priest and rebel against the world's conventions; hero of Ibsen's drama of that name; **1720.**
**Brandeis** (*brăn'dīs*), **Louis D.** (born 1856), Amer. jurist, b. Louisville, Ky.; people's counsel in many important cases involving social welfare; became associate justice of Supreme Court in 1916; **1892.**
**Brandenburg** (*brän'dĕn-bụrĸ*), province of cent. Prussia; 15,070 sq. mi.; pop. 2,446,000; nucleus of modern Prussia, **2928, 2929;** Thirty Years' War, **3489.**
**Brandenburg Gate,** Berlin, **386,** *picture,* **385.**
**Brandes** (*brän'dĕs*), **Georg** (born 1842), Danish author and literary critic ('Main Currents of the 19th Century'); **1892;** quoted, **432.**
**Brandon,** Manitoba. Second largest city of Manitoba, on Assiniboine R. 125 mi. w. of Winnipeg; pop. 15,500; flour, leather goods, furniture, engines; Brandon College.
**Brandy, 84.**
**Brandywine,** former village, now part of Wilmington, Del., **3743.**
**Brandywine Creek,** tributary of Delaware R. in Pa. and Del.; Howe defeated Washington at Chadd's Ford, Pa. (Sept. 11, 1777); **987, 3003;** falls at Wilmington, **3743.**
**Brang'wyn, Frank** (born 1867), Eng. painter and etcher, noted for his broad sweeping effects and vivid coloring; **1170.**
**Bran'ly, Edouard** (born 1846), Fr. scientist; improves coherer for wireless, **3760, 3766.**
**Brant, Joseph** (Thayendanegea) (1742–1807). Mohawk Indian chief, "perhaps the greatest Indian of whom we have any knowledge"; aided British in Rev. War.
**Brant,** a goose, **1488.**
**Brantford,** Ontario, city 60 mi. s.w. of Toronto on Grand R.; pop. 30,000; machinery, clothing, etc.; named for Joseph Brant; here Alexander Graham Bell perfected telephone, **380.**
**Branting, Hjalmar** (born 1860). First Socialist prime minister of Sweden 1920, again 1921; Nobel peace prize 1921; leading advocate Wilson peace program and League of Nations.
**Bras d'Or** (*brä dōr*) **Lakes, 640.**
**Brase'nose College,** Oxford, **2610,** *picture,* **2609.**
**Brass,** an alloy of copper and zinc, **99, 493, 3839;** mfrs. in Conn., **863;** pins, **2807.**
**Brasses, monumental, 3839.**
**Brassicaceae** (*brăs-ĭ-kā'sē-ē*), cabbage family, including mustard, radishes, and turnips, **554–5.**
**Brassie,** a wooden golf club with a brass plate on the sole, *pictures,* **1485.**
**Brass instruments, 2591.**
**Brasso** (*brä-sō'*). Same as **Kronstadt.**
**Bratislava** (*brä'tĕ-slä-vä*). Same as **Pressburg.**
**Brat'tleboro,** Vt. Village on Connecticut R. in s.e. of state; pop. 7324; toys, furniture, organs; chartered 1753.
**Brazil', United States of,** republic of S. Amer.; cap. Rio de Janeiro; 3,292,000 sq. mi.; pop. 30,650,000; **493–6,** *maps,* **494, 3288–9;** Amazon region, **105–6, 493, 494, 3284,** *picture,* **3285;** animals, **493, 105–6;** chief cities, **495–6, 3020, 3022, 3286;** climate, **494;** coffee industry, **822, 495, 3022,** *pictures,* **821, 822, 824;** foreign trade, **495, 496, 3022, 3286;** history, **496, 3289, 2888, 2890;** minerals, **494, 1001, 1407, 1410, 1411, 1479;** population, **493, 495, 2434, 3288,** *map,* **3288–9;** rainfall, **494,** *map,* **3288–9;** Roosevelt's explorations, **3062, 105;** rubber industry, **3072, 3073–4;** surface features, **494, 3284,** *map,* **3288–9;** transportation, **494, 495;** vegetation, *map,* **3288–9.**
**Brazilian Highlands, 3284.**
**Brazil nut, 2545–6.**
**Brazilwood, 3284, 1779.**
**Brazos** (*brä'zōs*) **River,** in e.-cent. Texas, flows s.e. 900 mi. to Gulf of Mexico; navigable for about 200 mi.; **3476, 3477.**
**Bread and baking, 496–500;** baking powder, **305;** flour, **1301–4;** food value, **1321, 1322;** rye, **3102;** unleavened, ceremonial use, **2691;** wheat, **3730;** yeast, **3828.**
**Breadfruit,** tree of Pacific isls., **501.**
**Breakfast cereals, 501–2, 2224.**
**Break rolls, 1302,** *picture,* **1303.**
**Breakspeare, Nicholas.** *See in Index* **Adrian IV.**
**Breakwater, 1578.**
**Breast stroke, 3410,** *pictures,* **3411.**
**Breast wheel, 3695.**
**"Breathes there a man with soul so dead," 1564.**
**Breathing.** *See in Index* **Respiration.**
**Breck'inridge, John Cabell** (1821–75), Amer. politician and soldier, b. near Lexington, Ky.; vice-president under Buchanan; Confederate general and sec. of war; presidential candidate, **1027, 2012.**
**Breda** (*brā-dä'*), Netherlands. Town 26 mi. s.e. of Rotterdam; pop. 30,000; once important frontier fortress, repeatedly taken by Spanish and French; residence of Charles II during exile.
**Breeches,** garment, **898, 900.**
**"Breeches Bible," 391.**
**Breeches-buoy, 1995.**
**Breech-loading rifle, 1254.**
**Breeding,** of animals and plants. *See in Index* **Live stock; Plant breeding.**
**Breed's Hill,** elevation near Bunker Hill, **533.**
**Breeze, 3751.**
**Brege** (*brā'gē*) **River,** in s. Germany, **961.**
**Breitenfeld** (*brī'tĕn-fĕlt*), Germany, village in Saxony 5 mi. n. of Leipzig; Swedish victories (1631, 1642) in Thirty Years' War; Gustavus Adolphus at, **1554.**
**Bremen** (*brā'mĕn*), Germany, free state; 99 sq. mi.; pop. 300,000; **502.**
**Bremen,** Germany, seaport on Weser R. 50 mi. from its mouth; pop. 250,000; **502;** a Hansa town, **1576.**
**Bremer** (*brē'mĕr*), **Fredrika** (1801–65). Swedish novelist and women's rights advocate ('The H. Family'; 'Homes in the New World'; 'Father and Daughter').
**Bremerhaven** (*brām'ĕr-hä-fĕn*), Germany, seaport on Weser estuary 35 mi. n.w. of Bremen; pop. 22,000; shipbuilding; **502.**
**Bren'ner Pass,** lowest pass over Alps (4500 ft.); railway opened in 1867; **3573, 3539, 3540.**
**Brennus** (*brĕn'ŭs*). Chief of Gauls; led invasion and sack of Rome in 390 B.C.
**Brent, Margaret,** pioneer in women's rights movement, **3778.**
**Brera** (*brā'rä*) **Palace,** Milan, **2235.**
**Bre'r** (*brĕr*) **Rabbit.** Hero of Joel Chandler Harris' 'Uncle Remus'; constantly outwits the stronger animals, his enemies.
**Brescia** (*brĕsh'ä*), Italy. Anc. city at foot of Alps, 52 mi. e. of Milan; pop. 90,000; fine Rom. remains; firearms, textiles, paper.
**Breslau** (*brĕz'lŏu*), Germany. Cap. of Prussian Silesia, on Oder R.; pop. 528,000; university; textiles, machinery; large trade in grain, live stock, metals, coal, timber.
**Brest,** France, seaport of Brittany; pop. 90,000; **502, 3802–3.**
**Brest-Litovsk** (*lē-tôvsk'*), Poland. Fortified town on Bug R. 120 mi. e. of Warsaw; pop. 58,000; r.r. and mfg. center; taken by Germans under Hindenburg after long resistance in 1915.
**Brest-Litovsk, Peace of** (1917), **451, 3575, 3798.**
**Bretigny** (*brē-tē-nyē'*), **Treaty of** (1360), **1700.**
**Breton** (*brē-tôn'*), **Jules** (1827–1906). Fr. painter of peasant life ('Women Gleaning'; 'Song of the Lark').
**Bret'on, Cape,** Canada, **3108.**
**Breton Club, 1859.**
**Bretons,** people of Brittany, **514–5;** language, **674, 1814.**
**Brevier type, 3572.**
**Brew'ster, Sir David** (1781–1868), Scotch scientist, discoverer of the laws of polarization of light by reflection and refraction; kaleidoscope, **1907.**
**Brewster, William** (1560–1664), *Mayflower* Pilgrim leader, ruling elder, and one of the founders of Plymouth, **2175.**
**Brian Boru** (*brī'ăn bō-rụ'*) or **Brian of the Tribute** (926–1014). "High king" of Ireland 1002–14, victor over Danes at Clontarf, where he was slain; figures in legend and history.
**Briand** (*brē-äṅ'*), **Aristide** (born 1862). Fr. orator and politician, former socialist; premier 1915–17, 1921–22, and several times previously; broke r.r. strike (1910) by calling strikers to colors; represented France at Limitation of Armament Conference in 1920.
**Brian de Bois-Guilbert** (*bwä-gēl-bĕr'*), knight in 'Ivanhoe', **3152–3.**
**Briareus** (*brī-ā'rē-ŭs*), in Gk. myth., hundred-handed giant, **3607.**
**Briarwood, 1621.**
**Brick and tile, 502–5;** clay, **783–5;** paving, **3027.**
**"Bricks without straw," 503, 784.**
**Brick tea, 3451.**
**Bridal Veil Falls,** in Yosemite valley, **3831.**
**Bridal wreath,** a flowering shrub, **3327.**
**Bride lace, 1950.**
**Bride'well.** Originally royal palace in London named from St. Bride's Well in vicinity; afterward for 300 years used as reformatory.
**Bridge, 505–9;** aerial, at Duluth, **1047;** arched, **506,** *pictures,* **508;** bascule, **506,** *picture,* **507;** Brooklyn, **505, 2495;** cantilever, **506,** *pictures,* **507, 509;** Cernavoda, Rumania, **3081;** Firth of Forth, **506, 1082;** Hell Gate, **506, 2495;** Key West viaduct, **506, 1921;** Memphis, Tenn., **2198;** New York City, **506, 2495;** Niagara, **2502;** Nihon-bashi, Tokyo, **3511;** Rialto, Venice, **3624;** St. Louis, **3109;** suspension, **505–6.**
—*Pictures:* Brooklyn, **508, 2490;** Devil's Canyon, Ariz., **2966;** Golden Horn, Constantinople, **871, 3557;** Key West viaduct, **1921;** London, **507, 2051;** Manhattan, **2490;** Quebec, **507;** Rialto, Venice, **3624.**
**Bridge of Sighs,** covered bridge in Venice; so called because condemned prisoners formerly passed over it from the judgment hall to place of execution; **3624.**
**Bridgeport,** Conn., 2d city of state, on Long Island Sound; pop. 143,555; **510.**
**Bridger, James,** discovers Great Salt Lake, **3612.**
**Bridges, Robert** (born 1844), Eng. poet and dramatist; poet laureate since 1913 ('Prometheus'; 'Achilles in Scyros'; 'Eros and Psyche'); **1167, 2848.**

**Bridges Creek,** Va., Washington's birthplace, **3674.**
**Bridget, Brigit,** or **Bride, Saint** (452?–523 A.D.). One of the 3 great saints of Ireland; founded church and monastery of Kildare.
**Bridgeton,** N.J. Port and mfg. city on Cohansey R. near Delaware Bay; pop. 14,323; iron, woolens, glass, canning factories; important settlement in Colonial days.
**Bridgetown.** Cap. of Barbados, Brit. W. Indies; pop. 17,000.
**Bridgewater Canal, 626.**
**Bridgman, Laura Dewey** (1829–89), Amer. blind deaf-mute, **436.**
**Brie** (*brē*), anc. dist. of France between Seine and Marne rivers; cheese, **709.**
**Brienne-le-Château** (*brē-ĕn'-lē-shätō'*), France, small town 23 mi. n.e. of Troyes on Aube R.; indecisive battle between Blücher and Napoleon (1814); military school attended by Napoleon, **2391,** *picture,* **2392.**
**Brienz** (*brē-ĕnts'*), **Lake,** in Switzerland, **3414.**
**Brieulles** (*brē'êl*) **sur-Meuse.** Fr. town on Meuse, 15 mi. n. of Verdun; buttressed e. end of Hindenburg line; captured by Amer. 3d Corps, Oct. 9, 1918.
**Brieux** (*brē-ē'*), **Eugène** (born 1858), Fr. dramatist noted for sensational treatment of social subjects, **1036;** chief works, **1038.**
**Briey** (*brē-ā'*), district in n.e. France; iron deposits, **103.**
**Brig,** ship, **3209.**
**Brigach** (*brē'ğäĸ*) **River,** in s. Germany, **961.**
**Brigade',** in U.S. Army, **218.**
**Brigadier-General,** in U.S. Army, **218;** insignia, **3576.**
**Brig'antine,** ship, **3209.**
**Bright, Sir Charles Tilston** (1832–88), Eng. engineer; first transatlantic cable, **560, 561.**
**Bright, John** (1811–89). Eng. liberal statesman and brilliant orator; a Quaker; lifelong friend and coworker of Cobden; began a long parliamentary career as chief orator for the Free Trade movement; greatest speech was in opposition to the Crimean War, but he reached the height of his popularity as champion of the Parliamentary Reform Bill of 1867.
**Bright-line spectrum, 3312.**
**Brighton** (*brī'tŏn*), England. Popular seaside resort 50 mi. s. of London; pop. 138,000.
**Brighton Beach,** N.Y., **857.**
**Bright's disease, 1922.**
**Brilliant pattern,** in diamond-cutting, **1002, 1004.**
**Brilliant type, 3572.**
**Brimstone,** or sulphur, **3389–90.**
**Brindisi** (*brēn'dē-zē*), Italy, anc. Brundisium, chief Rom. seaport on Adriatic; now commercial town of 25,000; Rom. ruins; **26.**
**Brine, 3115,** *picture,* **3117;** in refrigeration, **1362.**
**Bris'bane, Arthur** (born 1864). Amer. newspaper editor, b. Buffalo, N.Y., editor *New York Evening Journal, Washington Times,* etc.; noted for direct, forceful, popular style of editorials.
**Brisbane,** Australia, cap. of Queensland, on Brisbane R. 25 mi. above mouth; pop. 180,000; exports wool, hides, gold; **2950.**
**Briseis** (*bri-sē'is*), **8.**
**Bristles, 1560;** hedgehog, **1627;** porcupine, **2883;** used in brushes, **516.**
**Bristol,** Conn. City 15 mi. s.w. of Hartford; pop. 20,620; clocks, ball-bearings, brass, iron, and knit goods, tableware; famous in 18th cent. for wooden clocks.
**Bristol,** England, pop. 360,000; 8 mi. from Bristol Channel; **510, 1153, 1160, 561, 2883.**
**Bristol,** Pa. Borough on Delaware R. 20 mi. n. of Philadelphia; pop. 10,273; yarn, carpets, leather, chemicals.
**Bristol,** R.I., port on Narragansett Bay 13 mi. s.e. of Providence; pop. 11,375; partly destroyed during Rev. War; site was once home of Indian chief King Philip; shipyards, **2927.**
**Bristol Channel.** Arm of Atlantic between s. Wales and s.w. England.
**Britain** (Rom. *Britannia*), history (to 802), **1151–2;** prehistoric remains, **3361,** *pictures,* **515, 3360;** Celtic people and religion, **673–4;** early London, **2050–1;** Rom. conquest, **1152, 564, 3047, 3048, 2056, 2449;** Anglo-Saxon conquest, **1152, 3132, 515, 674, 1163;** Arthurian legends, **223, 3664;** Christianity introduced, **1152, 636.** For geography and later history *see in Index* **England; Scotland; Wales.**
**'Britan'nic',** ocean liner, **3218.**
**Britan'nicus** (42?–52 A.D.), son of Emperor Claudius, **2436.**
**British,** in Canada, **610;** in U.S., **3587.**
**British Baluchistan, 1744.**
**British Columbia,** westernmost province of Canada; 388,263 sq. mi.; pop. 720,000; cap. Victoria; **510–3, 603,** *map,* **602–3;** agriculture, **510, 512, 608;** chief cities and industries, **512–3, 3638–9, 3617;** fisheries, **512, 3617,** *picture,* **608;** forests, **512, 603, 3617,** *pictures,* **606, 607;** minerals, **512, 3617;** mountains, **512, 3036,** *picture,* **602.**
**British Columbia, University of,** at Vancouver, B.C., opened 1915; co-ed., provincial control; arts, applied science, agriculture, **3617.**
**British courts, 909.**
**British East Africa,** large territory in center of e. coast including Kenya, Tanganyika, and Uganda protectorates and isls. of Zanzibar and Pemba, **1068, 1070, 513,** *map,* **1069;** natives, *picture,* **33.**
**British East Africa Protectorate** or **Kenya Colony;** 247,000 sq. mi.; pop. 2,810,000; **1068, 1070,** *map,* **1069.**
**British East India Company.** *See in Index* **East India Company.**
**British Empire, 513–4, 1150–1,** *map,* **514,** *Study Outline,* **3901–2;** in Africa, **40, 3280–3;** in Asia, **232–3, 2201;** Chatham's part in building, **700;** decorations of honor, **978,** *pictures,* **977;** Disraeli extends **1013;** in E. Indies, **1072;** flags, **1287;** foundations laid, **513, 1154, 3180–1;** government, **513–4, 837, 616, 555;** Imperial War Cabinet, **466–7;** India, **1752–3, 796, 1596;** Laurier's idea of, **1971;** in League of Nations, **467;** possessions in Pacific, **2624;** Queen Victoria, **3640.**
**British Guiana,** a crown colony on n.e. coast of S. Amer.; 90,000 sq. mi.; pop. 310,000; cap. Georgetown; **1546–7,** *maps,* **1547, 3288–9.**
**British Honduras,** a crown colony in Cent. Amer.; 8600 sq. mi.; pop. 45,000; cap. Belize; **1676, 679–80, 3834–5,** *maps,* **680, 2514–5.**
**British India,** that part of India directly subject to Brit. law, **1754,** *map,* **1745.**
**British Isles,** name popularly applied to Gt. Brit., Channel Islands, Ireland, Isle of Man, and numerous surrounding isls.; 121,633 sq. mi.; pop. 46,000,000; *maps,* **1152, 1159, 1196–7;** once part of continent, **1191.** *See also in Index* **England; Great Britain; Ireland;** etc.
**British Museum, 1198, 1200, 2056,** *picture,* **1206;** collections, *pictures,* **1206, 1525;** library, **1992.**
**British New Guinea.** *See in Index* **Papua.**
**British North America Act, 621, 622.**
**British North Borneo,** colony in n. Borneo; 31,106 sq. mi.; pop. 208,000; timber, rubber, tobacco; **468.**
**British oak, 2547–8.**
**British Somaliland,** protectorate in n.e. Africa bordering Gulf of Aden; 68,000 sq. mi.; pop. 300,000; chief town, Berbera; **41,** *map,* **40–1;** natives, **37.**
**British South Africa Company, 3011, 3282.**
**British thermal unit, 1618, 1620.**
**Brit'omart.** A maiden knight, representing chastity, in Spenser's 'Faerie Queene'.
**Brit'ons,** early Celtic inhabitants of British Isls., **673–4, 1151–2;** baskets, **342;** weapons, *pictures,* **515.** *See also in Index* **Britain.**
**Brit'tany,** old province of n.w. France, **514–5, 1192, 1345, 1346;** fisheries, **1282;** people, **1344,** *picture,* **1347;** roadside shrine, *picture,* **1346.**
**Brno** (*bĕr'nō*). Same as **Brünn.**
**Broad bean, 349.**
**Broadcloth,** weaving of, **3327.**
**Broad-leaved trees,** one of the two great tree divisions, **3530, 3533.**
**Broadway,** street, New York City, **2490–1,** *picture,* **2493.**
**Brobdingnag** (*brŏb'dĭng-năğ*), in 'Gulliver's Travels', **3409.**
**Brocade',** a cloth, **804.**
**Broche** (*brōsh*), implement used in tapestry weaving, **3434.**
**Brock, Sir Isaac** (1769–1812). Brit. general, "hero of Upper Canada"; captured Detroit in the War of 1812; killed during Amer. attack on Queenston Heights.
**Brocken,** highest peak in Harz Mts. (3745 ft.), **1595.**
**Brock'et,** a S. Amer. deer, **981.**
**Brockton,** Mass., 18 mi. s. of Boston, one of most important centers in world for mfr. of men's shoes; pop. 66,254; shoe accessories, rubber goods, boxes; **2165.**
**Brockville,** Ontario. Port, r.r. and mfg. city on St. Lawrence R. 60 mi. s. of Ottawa; pop. 9500; dairy products, hardware, automobiles, steam engines, machinery.
**Broken bones,** how to set, **1268,** *picture,* **452.**
**Broken Hill,** Australia, mining town in w. of New South Wales; pop. 23,000; **2471.**
**Broker, 440–1, 3360.**
**Brokerage, 3360.**
**Bromberg** (*brōm'bĕrĸ*) or **Bydgoszcz** (*bĭd'-gōshch*), Poland. City on canal between Oder and Vistula; formerly in province of Posen, Prussia; pop. 58,000; important trade center.
**Bromelia family** of plants, **69, 3939;** Spanish moss, *picture,* **1299.**
**Bromide,** a compound of bromine; of silver, in photography, **755, 2780–1, 3242.**
**Bro'mine,** chemical element. **755, 4042;** poisonous properties, **2855.**
**Bronchi** (*brŏn'kī*) (sing., bronchus), the two main branches of the windpipe, or trachea, **2083.**
**Bronchial tubes, 2083.**
**Broncho** or **bronco,** *picture,* **49.**
**Bron'stein, Leon,** real name of Leon Trotzky, **3544.**
**Brontë** (*brŏn'tā*), **Anne** (1820–49). Eng. author, youngest sister of Charlotte Brontë ('The Tenant of Wildfell Hall').
**Brontë, Charlotte** (1816–55). Eng. novelist, one of a strange family of geniuses ('Jane Eyre', novel that brought her fame, and still the most popular of her works; 'Shirley', portrait of Emily Brontë; 'Villette', considered by many her masterpiece; 'The Professor').
**Brontë, Emily** (1818–48). Sister of Charlotte Brontë, considered by many greatest genius of the family ('Wuthering Heights', crude and powerful romance).
**Bron'tosaurs,** prehistoric reptiles, **132, 134,** *picture,* **133.**
**Bronx,** a borough of New York City, **2494–5, 2498.**
**Bronze,** alloy of copper and tin, **515, 99, 881;** copper-aluminum, **104;** Japanese work, **1874, 1876;** statuary, **3154.**

**Bronze Age,** period in history characterized by use of bronze, **515, 881, 1655;** gave way to Iron Age, **1817, 29, 297, 1106.**
**Bronze turkey, 3556.**
**Brooke, Dorothea.** Heroine of George Eliot's 'Middlemarch'.
**Brooke, Mrs. Frances** (1724–89), Canadian novelist, **623.**
**Brooke, Sir James** (1803–68), rajah of Sarawak, Borneo; wealthy retired Eng. soldier; suppressed piracy and head-hunting and introduced civilization; **468.**
**Brooke, Rupert** (1887–1915), Eng. poet of great promise ('Poems'; '1914 and Other Poems'; 'Letters from America'); died in World War, **1168.**
**Brook Farm,** communistic experiment founded 1841 at West Roxbury, Mass., by members of the Transcendental Club with George Ripley as leader and Hawthorne, Margaret Fuller, Channing, Emerson, and Thoreau as members or sympathizers; dissolved 1847; gives Hawthorne idea for 'Blithedale Romance', **1607.**
**Brookline,** Mass., residential suburb of Boston; first settled in 1634; pop. 37,748; **472.**
**Brooklyn,** N.Y., a borough of New York City on Long Isl.; pop. 2,018,356; **515, 2488.**
**Brooklyn Bridge, 505–6, 223;** *pictures,* **508, 2490.**
**Brooklyn Polytechnic Institute.** At Brooklyn, N.Y., founded 1853; chemical, mechanical, civil, and electrical engineering.
**Brooks, Phillips** (1835–93), Amer. preacher, b. Boston, Mass.; famous pulpit orator, Episc. bishop of Mass.; grave, **472.**
**Brooks, Preston Smith** (1819–57), Amer. congressman from South Carolina **1852–56;** assaults Charles Sumner, **3392.**
**Brook trout, 3545.**
**Broom,** shrub of the pea family; emblem of the Plantagenets, **1633.**
**Broom corn, 516, 3276, 1911.**
**Broomcorn millet, 2239.**
**Brooms and brushes, 516.**
**"Brother Jonathan,"** nickname for U.S., **2507.**
**Brothers of the Christian Schools, 2302.**
**Brougham** (*brō'ăm*), **Henry, Baron** (1778–1868). Brit. lord chancellor and Liberal reforming statesman; made reputation as counsel for Queen Caroline in defense against divorce from George IV; his unique private carriage was forerunner of the brougham.
**Brown, Charles Brockden** (1771–1810), Amer. novelist, b. Philadelphia; first Amer. professional man of letters, **112.**
**Brown, Ford Madox** (1821–93), Eng. painter; realistic treatment of historical subjects; inspires Pre-Raphaelite movement, **2632;** painting by, *picture,* **703.**
**Brown, George** (1818–80). Canadian statesman, b. in Scotland; one of earliest advocates of Confederation and one of first to foresee the development of Canadian Northwest; founded the Toronto *Globe.*
**Brown, Henry Kirke** (1814–86), Amer. sculptor, noted for his statues of public men, **3164.**
**Brown, John** (1800–59), Amer. abolitionist, **516;** in Kansas, **1913.**
**Brown, John** (1810–82). Scotch physician and writer ('Rab and His Friends'; 'Pet Marjorie'; little masterpieces of keen, kindly, humorous character-drawing).
**Brown, Peter,** carpenter of the *Mayflower,* **516, 2178.**
**Brown Bess,** type of musket, **1252, 1254,** *picture,* **1253.**
**Browne, Charles Farrar,** Amer. humorist. *See in Index* **Ward, Artemus.**
**Browne, Sir Thomas** (1605–82), Eng. physician and author; unrivaled master of stately, rhythmic, but highly artificial and latinized prose style ('Religio Medici'; 'Urn-Burial'); **1165.**
**Browne, Thomas Alexander.** *See in Index* **Boldrewood, Rolf.**
**Brownian movements, 2230.**
**Brownie,** in Scotch folklore, good-natured goblin who milks cows, sweeps floors, and does other household drudgery for the family to which he attaches himself, **1219.**
**Browning, Elizabeth Barrett** (1806–61), Eng. poet, wife of Robert Browning, **516, 517, 1167;** attacks child labor, **729.**
**Browning, John M.** (born 1854), Amer. inventor, **2097.**
**Browning, Robert** (1812–89), Eng. poet, **517–8, 1167,** *picture,* **1167.**
**Browning machine guns, 2097.**
**Brown race, 2956, 2957, 2881;** *Study Outline,* **3868.**
**Brown rat, 2977.**
**Brownsville,** Tex., city at mouth of Rio Grande; important gateway for trade between Mexico and U.S.; large sugar and oil mills; pop. 11,791; scene of numerous disturbances with Mexicans; **3477.**
**Brown-tail moth, 1328.**
**Brown thrasher, 3493.**
**Brown University.** At Providence, R.I.; co-ed., Bapt. originally, now non-sectarian; present name 1804, in honor of Nicholas Brown, a benefactor; arts, pure science, electrical and mechanical engineering; **2928.**
**Bruce, James** (1730–94). Scotch explorer, rediscoverer of source of Blue Nile and first white man to follow it from its source to junction with White Nile.
**Bruce, Robert** (1274–1329), king of Scotland, victor at Bannockburn, **518, 3148.**
**Bruch** (*brŭĸ*), **Max** (1838–1920), Ger. violinist and composer (operas, 'Lorelei' and 'Hermione'; for violin, 'Kol Nidrei' and four concertos; cantatas, probably his greatest works, 'Frithjof', 'Salamis', 'Odysseus', 'Achilleus'); **1892.**
**Brucine** (*brō'sĭn*), a drug, **3372.**
**Bruges** (*brüzh*), Belgium, old Flemish town 55 mi. n.w. of Brussels; pop. 52,000; **518–20,** *picture,* **374;** medieval market, **373.**
**Bruises,** treatment for, **1269.**
**Brum'mell, George Bryan** (1778–1840). "Beau Brummell," Eng. dandy, dictator of fashion, early friend of Prince of Wales (King George IV).
**Brunei** (*brų-nā'ē*), state in n.w. Borneo; 4000 sq. mi.; pop. 32,000; chief town, Brunei (10,000); **468.**
**Brunel', Sir Marc Isambard** (1769–1849), Brit. inventor and engineer; constructed Thames Tunnel; **1799.**
**Brunelleschi** (*brų-nĕl-lĕs'kē*), **Filippo** (1379?–1446), Ital. architect, called founder of Renaissance architecture: dome of Florence cathedral, **1848,** *pictures,* **1294, 1834;** and Donatello, **1847–8;** Ghiberti, **1456.**
**Brunetière** (*brü-nĕ-tyĕr'*), **Ferdinand** (1849–1906), Fr. critic, editor of the *Revue des Deux Mondes,* **1365;** quoted, **1363.**
**Brunhild** (*brųn'hĭld*) or **Brunhilda,** in Scand. myth., valkyrie whom Odin punishes for disobedience by placing her inside a ring of fire, there in a charmed sleep to await the hero destined to waken her; in 'Nibelungenlied', **2504.**
**Brunhilde** (d. 613 A.D.), queen of Austrasia, daughter of Athanagild, king of the Visigoths, **1658.**
**Brünn** (*brün*) or **Brno,** Czecho-Slovakia. Cap. of Moravia, 70 mi. n. of Vienna; pop. 126,000; woolen mfrs.; univ.
**Bru'no, Giordano** (1548?–1600), Ital. Renaissance philosopher; attacked orthodox Aristotelian doctrine; put to death, **1796.**
**Bruno, Saint** (1030?–1101), founds Carthusians, **2299.**
**Brunswick.** Republic in w. Germany, duchy until 1918; 1418 sq. mi.; pop. 480,000. Also its cap., an old city 35 mi. s.e. of Hanover; pop. 140,000; extensive mfrs.; 12th cent. cathedral.
**Brunswick,** Ga. Seaport and popular resort on Saint Simons Sound, 8 mi. from Atlantic; pop. 14,413; truck gardening, fishing, and canning interests.
**Brunswick,** Me., mfg. town 25 mi. n.e. of Portland; pop. 5784; **2128;** Bowdoin College, *picture,* **2128.**
**Brunswick** or **Hanoverian dynasty** (England), **1576.**
**Brusa** (*brų'sà*). Second city of Turkey, 15 mi. s. of Sea of Marmora; pop. 110,000; hot sulphur springs; silk and carpet mfrs.
**Brush, Charles F.** (born 1849), Amer. inventor; invented type of dynamo; developed practical arc light, **1123.**
**Brush, George de Forest** (born 1885). Amer. painter, b. Shelbyville, Tenn. (many "mother and child" groups).
**Brush,** current-collecting part of dynamo, **1052,** *pictures,* **1051.**
**Brushes and brooms, 516.**
**Brush turkey,** of Australia, **1090.**
**Brussels** (*brŭs'ĕlz*), cap. of Belgium; pop. 680,000; **520, 373–4;** Bourse, *picture,* **376.**
**Brussels, University of, 520.**
**Brussels carpet, 3080, 374;** *picture,* **3078.**
**Brussels lace, 1950, 374.**
**Brussels sprouts,** vegetable of cabbage type, **553, 555;** when and how to plant, **1397.**
**Brussilof** (*brų-sĭ'lŏf*), **Alexei** (born 1856). Rus. general; brilliant successes in Galicia 1914–15 and 1916; after revolution of 1917 was in supreme command for short time, later accepting Bolshevik régime.
**Bru'tus, Lucius Junius,** legendary Rom. patriot; one of first 2 consuls of the Republic (509 B.C.); **3041–2.**
**Brutus, Marcus Junius** (85?–42 B.C.), one of Caesar's assassins; real hero of Shakespeare's 'Julius Caesar'; **565.**
**Brutus the Trojan.** Mythical first king of Britain, grandson of Ascanius, the son of Aeneas.
**Bruxelles** (*brü-sĕl'*). Fr. name for Brussels, **520.**
**Bruyère, Jean de la.** *See in Index* **La Bruyère.**
**Bryaceae** (*brī-ā'sĕ-ē*), largest moss family, **2340.**
**Bryan, William Jennings** (born 1860), Amer. political leader and editor, **520–1, 2104, 3744, 3746.**
**Bryant, William Cullen** (1794–1878), "father of Amer. poets," **521, 112;** quoted, **2596;** translation of Homer, **1676.**
**Bryce, George** (born 1844). Canadian historian and Presb. clergyman; organizer of Manitoba College (1871); authority on Canadian Northwest ('Remarkable History of Hudson's Bay Company'; 'A Short History of the Canadian People').
**Bryce, James, Viscount** (1838–1922), Brit. statesman and historian, ambassador to U.S. ('The Holy Roman Empire'; 'The American Commonwealth', a classic; 'Modern Democracies'; 'A Study of American History'); quoted, **493.**
**Bryn Mawr** (*brĭn mär*) **College.** At Bryn Mawr, Pa.; women; opened 1885 (founded 1880); arts and sciences.
**Bryol'ogy,** science of mosses, **475.**
**Bryophytes** (*brī'ŏf-ītz*), plant group, **2831, 3938;** includes liverworts **2032,** mosses, **2340.**

**Bryozoa** (*brī-ō-zō'à*), or moss animals, **3814, 3813, 3945**; evolutionary position, *diagram*, **128.**
**Brython'ic languages, 1814.**
**Bry'um,** genus of mosses, *picture*, **2339.**
**Bubon'ic plague,** epidemic disease, causing swollen glands, fever, and rapid death, **1450, 1452**; carried by fleas and rats, **1292, 2977**; great epidemics, **433, 694**; serum treatment, **151–2.**
**Buccaneers',** piratical adventurers (chiefly Eng. and Fr.) who in 17th cent. plundered Spaniards along coasts of W. Indies and S. Amer., **644.** *See also in Index* **Pirates.**
**Buccleuch** (*bŭk'lū*), **Henry Scott,** 3d **Duke of** (1746–1812), friend of Walter Scott, **3151.**
**Bucephalus** (*bū-sĕf'ă-lŭs*). War horse of Alexander the Great.
**Buchanan** (*bū-kăn'ăn*), **James** (1791–1868), 15th president of U.S., **521–3**; on Mexican question, **2208.** —*Administration:* Dred Scott decision, **1039**; first Atlantic cable laid, **560**; Lincoln-Douglas debates, **2017–8, 1027**; John Brown's raid, **516**; secession, **777, 1333.**
**Bucharest** (*bū-kà-rĕst'*), cap. of Rumania, 30 mi. n. of Danube R.; pop. 340,000; **523, 3082, 3795.**
**Bucharest, Treaty of,** ended 2d Balkan War (1913), **310, 3080, 3115, 523.**
**Bucharest, University of,** state univ. of Rumania, founded 1864; law, medicine, science, philosophy, theology, mathematics; **523.**
**Buck, Dudley** (1839–1909), Amer. organist, composer, and author, b. Hartford, Conn.; chief works, **2380.**
**Buck,** or male deer, **979.**
**Buckeye,** or Amer. horse-chestnut, a tree, **523–4**; classified, **3533**; growth of buds, *pictures*, **2413**; "red" type poisons fish, **2854.**
**Buckeye butterfly,** color plate facing **458.**
**Buckeye State, 2572.**
**Buck'ingham, George Villiers, Duke of** (1592–1628), Brit. courtier, unscrupulous favorite of James I and Charles I (called "Steenie" by James); involved England in war with France; **691.**
**Buckingham, Henry Stafford, Duke of** (1454?–83), **3017.**
**Buckingham, William A.** (1804–75), governor of Conn., **869.**
**Buckingham Palace,** London, **2054–5.**
**Buckinghamshire** or **Bucks.** South-midland county, England; 743 sq. mi.; pop. 228,000; great dairying center.
**Buckle, Henry Thomas** (1821–62). Eng. historian ('History of Civilization in England').
**Buck'nell University.** At Lewisburg, Pa.; co-ed.; arts and sciences, school of music; incorporated 1846.
**Buck'ner, Simon Bolivar** (1823–1914), Amer. soldier and politician, b. Ky.; Confederate general; governor of Ky. 1887–91; surrenders Ft. Donelson, **1498.**
**Buckskin,** sources of, **1977**; tanning, **1976.**
**Buckthorn,** a flowering shrub; Calif. species yields cascara, **330.**
**Buckwheat, 524**; introduced in Europe, **932,** *picture*, **2484.**
**Buckwheat** or **dock family** of plants, **3940**; includes buckwheat, **524**; rhubarb and dock, **3013.**
**Bucolics** (*bū-kŏl'ĭks*) (from Gk. word for "cowherd"). Pastoral poems of Gk. and Rom. poets, particularly Vergil.
**Bucyrus** (*bū-sī'rŭs*), Ohio. City on Sandusky R. 65 mi. s.e. of Toledo; pop. 10,425; machinery, copper kettles, tires, etc.; near numerous mineral springs.
**Bu'da,** Hungary, now Budapest, **524.**
**Budapest** (*bụ'dä-pĕst*), cap. of Hungary on Danube R.; pop. 880,000; **524**; Danube R., **962.**
**Buddha** (*bụ'dà*) (about 568–488 B.C.), Hindu prince Siddhattha Gotama, founder of Buddhism, **524–5**; legendary ascent to heaven from Ceylon, **684**; bo-tree, **3533, 685**; Daibutsu (bronze statue), **1874,** *picture*, **1876**; statues in Canton, *picture*, **638.**
**Bud'dhism,** an Oriental religion, **525, 1864**; Burma, **541, 1749**; caste, **1868–9**; China, **744**; distinguished from Hinduism, **1651**; influence on architecture, **1755**; Japan, **1868, 1864**; number of adherents, **2994**, in India, **1749**; Siam, **3226, 3227**; temples, **639, 1879,** *picture*, **1878.**
**Budding,** of yeast, **3828,** *picture*, **3828.**
**Budejovice.** Same as **Budweis.**
**Budget Bureau,** U.S., **3598, 1582.**
**Budweis** (*bụd'vīs*) or **Budejovice,** Czecho-Slovakia. City in Bohemia on Moldau R. 80 mi. s. of Prague; pop. 45,000; industrial and commercial center.
**Buenaventura** (*bwā-nä-vĕn-tọ'rä*), Colombia, port on Pacific at mouth of Dagua R.; important trade center; **836.**
**Buena Vista** (*bụ'nà vĭs'tà*), Mexico, village near Saltillo; battle of, **2208, 3444.**
**Buenos Aires** (*bō'nọs ā'rēz*), cap. of Argentina, harbor on Rio de la Plata, 165 mi. from sea; pop. 1,640,000; **525–7, 192**; Plata R., **2831.**
**Buffalo,** N.Y., at e. end of L. Erie, 2d largest city of state; pop. 506,–775; **527–8**; Grover Cleveland mayor, **790.**
**Buffalo,** animal of Asia and Africa, **527**; "American buffalo" or bison, **428–31**; carabao, *picture*, **2765**; in Formosa, **1332**; in India, **1748**; and tsetse fly, **131.** For American buffalo *see also in Index* **Bison.**
**Buffalo, University of.** At Buffalo, N.Y.; co-ed.; founded 1846; arts and sciences, engineering, library science, teachers' training, medicine, law, dentistry, pharmacy, chemistry.
**Buffalo Bayou,** Tex., **1688.**
**"Buffalo Bill"** (William Frederick Cody) (1846–1917), noted Amer. frontiersman and Indian fighter, **528, 3818.**
**Buffalo bird, 527.**
**Buffalo bur, 2902.**
**Buffalo Gap,** S.D., **3296.**
**Buffalo gnat,** an insect closely related to the northern black fly; torments horses and cattle; **1476**; eggs, **1090.**
**Buffalo moth,** a beetle, **370.**
**Buffer states,** areas strategically or economically important, whose independence is sanctioned by great powers as checks or "buffers" on rival nations; in Europe, **1193, 2086**; Afghanistan, **31**; Siam, **3226.**
**Buffon** (*bü-fôn'*), **George Louis Leclerc, Comte de** (1707–88), Fr. naturalist and writer ('Natural History'), **1365, 3841.**
**Bug,** two rivers of Europe; one, also called Western Don, rises in Poland, flows n. 470 mi. into Vistula at Novo Georgievsk, **3651,** *map*, **2888**; the other, in s.w. Ukraine, flows about 450 mi. to Black Sea; *map*, **434.**
**"Bug,"** a telegraph transmitter, *picture*, **3457.**
**"Bug Bible," 391.**
**Bugle,** *picture*, **2382.**
**Bugs,** insects with sucking beaks, **1787,** *Study Outline*, **3946**; beetles are not "bugs," **371**; chinch, **752**; cicada, **765**; cochineal, **817**; "green" or aphid, **154**; killed by sprays, **3330**; "nymph" stage of growth, **1786**; scientific name, **1788**; water-bugs, **3696, 3698.**
**Building and Loan Association, 528.**
**Building construction and materials, 528–32**; acoustics, **3278**; ancient methods, **528**; bell towers, **377**; brick and tile, **502–5**; cement, **674–6**; clay, **783–5**; concrete, **530–2, 856**; elevators, **1132–4**; fireproofing, **1263, 531**; foundations, **530, 1014**; granite, **1497**; heating and ventilation, **1621–4**; iron and steel, **1815–26, 529–30, 531**; limestone, **2010**; lumber, **2076–83**; marble, **2144**; sandstone, **3123**; skyscrapers, **529, 2489**; stucco, **532**; terra cotta, **531**; theater, **3482–5**; in U.S., **3590.** *See also in Index* **Architecture.**
**Bukken Fiord.** Arm of Atlantic in s.w. Norway; 10 to 15 mi. wide, extending 35 mi. inland; just s. of Hardanger Fiord.
**Bukovina** (*bụ-kō-vē'nà*), former crownland of Austria; 4030 sq. mi.; pop. 800,000; cattle-raising and farming; *maps*, **308, 271**; Rumania acquires, **3080.**
**Bulama** (*bụ-lä'mà*) or **Bolama.** Cap. of Port. Guinea, w. Africa; on isl. of same name.
**Bulawayo** (*bụ-là-wä'yō*). Town in S. Rhodesia, S. Africa; cap. of Matabeleland; white pop. 5000; Cecil Rhodes buried here.
**Bulbs, tubers, and rootstocks, 532**; bloodroot, **438–9**; crocus, **923**; hyacinth, **1706–7**; iris, **1814**; lily, **2008–9**; mandrake, **2135**; onion, **2581**; potato, **2900–2**; tulip, **3547.**
**Bul'bul,** a Persian bird, **2508, 2509.**
**Bul'finch, Charles** (1763–1844). Amer. architect, b. Boston designed rotunda of capitol at Washington; his sincere simple style greatly influenced Amer. architecture.
**Bulfinch, Thomas** (1796–1867). Amer. author, b. Boston ('Age of Fable'; 'Age of Chivalry'; 'Legends of Charlemagne').
**Bulga'ria,** Balkan state; 40,000 sq. mi.; pop. 4,500,000; **532–3,** *maps*, **308, 1196–7**; in Balkan wars, **310**; people, **3250, 307, 308**; cap. Sofia, **3272**; wheat, **3732**; in World War. **3795, 3806, 3812.**
**Bulkhead,** of a ship, **3217.**
**Bull, Ephraim, 1501.**
**"Bull, John,"** nickname for typical Englishman, **2507.**
**Bull, Ole** (1810–80), a celebrated Norwegian violinist, largely self-taught; prodigious technique; **2532.**
**Bull,** The male of domestic cattle and numerous other animals, especially deer, elk, moose, elephant, whale, seal.
**Bull** or **Taurus,** a constellation, **3840, 2838**; *charts*, **873, 3343.**
**Bull** (papal), **2666.**
**Bull, Golden, 1675, 1447–8, 1357.**
**Bullard, Robert Lee** (born 1861), major-general, U.S. Army; graduated U.S. Military Academy 1885; in Cuba and Philippine Isls. 1898–1904; commanded first Division, A.E.F., Dec. 14, 1917—July 14, 1918, 3d Corps July 14—Oct. 11, 1918; lieutenant-general (temporary) Oct. 1918; Army of Occupation 1918—Apr. 15, 1919; **194.**
**Bull-bat,** a nighthawk, **2508.**
**Bulldog, 1021, 1023**; *picture*, **1019.**
**Bul'len, Frank T.** (1857–1915). Eng. writer of sea stories ('The Cruise of the Cachalot'; 'Sea Wrack'; 'The Call of the Deep').
**Bullet, 1254, 1256,** *picture*, **634**; antimony used, **150**; lead, **1973**; shrapnel, **635.**
**Bullet tree, 1554.**
**Bull fighting, 3303,** *pictures*, **2211, 3305.**
**Bullfrog, 1375.**
**Bullhead,** a catfish, **662.**
**Bullion State, 3347.**
**Bull Moose** or **Progressive party;** in U.S., **3062, 3429.**
**Bullock's oriole, 2601,** *picture*, **417.**
**Bull Run, battle of,** July 21, 1861, first battle of Civil War, **533, 778**; second battle, Lee defeated Pope, August 29-30, 1862.
**"Bulls and bears," 441.**
**Bull-snake, 3260, 3259.**
**Bull terrier,** *picture*, **1021.**

**Bülow** (*bü'lō*), **Bernard von, Prince** (1849–1921). Ger. statesman and diplomat, imperial chancellor 1900–09; in 1914–15 special ambassador to Italy in attempt to keep Italy in Triple Alliance.
**Bülow, Frederick William, Baron** (1755–1816). Prussian general, conspicuous in 1812 at battle of Leipzig; overran Holland and Belgium; aided Wellington at Waterloo.
**Bülow, Hans Guido von** (1830–94). Ger. pianist and conductor, one of the greatest of his time.
**Bulrush, 3083.**
**Bulwer-Lytton.** *See in Index* **Lytton.**
**Bumble.** Fat pompous beadle who terrorizes workhouse inmates in Dickens' 'Oliver Twist'.
**Bumblebee, 359, 362–3,** *pictures,* **360,** color plate, **358–9;** pollinates red clover, **809.**
**Bump'po, Natty,** frontiersman in Cooper's 'Leatherstocking Tales', **878.**
**Bundesrat** (*bụn'dĕz-rät*), Ger. federal council, **1449;** Baden representation, **303;** dominated by Prussia, **2929.**
**Bunker Hill, battle of,** June 17, 1775, first battle of Amer. Rev., **533–4.**
**Bunker Hill Monument, 472, 15, 3711,** *picture,* **471.**
**Bunsen** (*bŭn'sĕn*), **Robert Wilhelm** (1811–99), Ger. chemist; developed spectrum analysis; isolated elements caesium and rubidium; explained geysers, **1454;** invented Bunsen burner, **1407.**
**Bunting,** bird of finch family, **534;** indigo, **1241;** snow, *picture,* **411.**
**Bun'yan, John** (1628–88), Eng. Puritan leader and author of 'Pilgrim's Progress', **534–8, 1165, 2539;** 'Pilgrim's Progress', story of, **535–8.**
**Buonarroti** (*bwô-nä-rô'tē*). *See in Index* **Michelangelo.**
**Buondelmonti** (*bwōn-dĕl-mōn'tē*), Florentine family, **1293.**
**Buoy** (*boy*), a navigation aid, **2006;** acetylene-lighted, **8.**
**Buoyancy,** of air, **52;** Archimedes' principle, **174, 1508–9.**
**Buran** (*bụ'rän*), a Siberian blizzard, **3751.**
**Bur'bage** or **Burbadge, Richard** (1567?–1619), Eng. actor, famous for impersonation of Shakespearean characters; associated with Shakespeare, **3190.**
**Burbank, Luther** (born 1849), Amer. experimenter in plant breeding, **538–9, 563, 2880, 2977.**
**Bur'chell's zebra, 3838.**
**Burdekin River,** Queensland. Rises on e. slope of Great Dividing Range and flows 350 mi. into Pacific in lat. 19° 45' s.
**Burdett-Coutts** (*bûr-dĕt'-kọtz*), **Angela Georgina, Baroness** (1814–1906). Eng. philanthropist, greatest heiress of her time.
**Burdette** (*bûr-dĕt'*), **Robert J.** (1844–1914). Amer. humorist, minister, and writer, b. Greensboro, Pa.
**Burdock, 3712;** seeds, *picture,* **3172.**
**Bureau** (*bū'rō*), in U.S. govt. *See in Index* **Census, Bureau of; Education, Bureau of,** etc.
**Bur'genland.** Industrial district on w. border of Hungary; 1700 sq. mi.; pop. 346,000; awarded to Austria by Treaty of Trianon; steps to occupy region Aug. 1921 met with armed resistance of inhabitants, ardent Magyar supporters; countries agreed to leave settlement to plebiscites.
**Burgess, Gelett** (born 1866). Amer. humorist, b. Boston ('Goops and How to Be Them'; 'Are You a Bromide?').
**Bur'gesses, House of,** the first Amer. representative legislative body, called in Virginia in 1619; name continued until time of Rev. War; Patrick Henry's speech on Stamp Act, **1637–8,** *picture,* **1881.**
**Burgos** (*bụr'gōs*), Spain, former cap. of old Castile on Arlanzon R. 130 mi. n. of Madrid; pop. 33,000; **3300.**
**Burgoyne** (*bûr-goin'*), **John** (1722–92), Eng. general in Amer. Rev.; northern campaign and defeat at Saratoga, **3003, 3126, 1409, 80.**
**Burgun'dian party,** in France, **694.**
**Burgundians,** Germanic tribe, **1194, 1343.**
**Burgundy** (*bûr'gŭn-dĭ*), former kingdom and duchy in e-cent. France, now included in 4 depts., *map,* **1351;** history, **697, 1632, 1195;** 15th cent. costume, *picture,* **899;** wine, **1346.**
**Burgundy pitch, 3436.**
**Burial and funeral customs,** anc. Egypt, **1098,** *picture,* **1102;** Hindu, **1751;** Mohammedan, **955;** Parsee, **451;** in Siam, **3226.**
**Buriats** (*bụ'ri-ăts*), branch of Mongols, **2286.**
**Bu'rin,** an engraving tool, **1168.**
**Burke, Edmund** (1729–97), Brit. statesman, orator, and writer, **540;** literary associations, **1166, 1483;** and William Pitt, **2812.**
**Burlap, 1906, 2018.**
**Burleigh** (*bûr'lĭ*) or **Burghley, William Cecil, Baron** (1520–98). Eng. statesman, for 40 years chief adviser of Queen Elizabeth.
**Burlesques** (*bûr-lĕsks'*), in Gk. drama, **1032–3.**
**Burley tobacco, 3509.**
**Bur'lingame, Anson** (1820–70). Amer. diplomat, b. New Berlin, N.Y.; U.S. minister to China 1861–67; so gained confidence of Chinese govt. as to be appointed special envoy from China to U.S. and principal European nations; negotiated "Burlingame Treaty."
**Burlingame Treaty** (1858). First recognition by China of principles of international law; granted equal privileges between China and U.S.
**Burlington,** Iowa, city in s.e. on Mississippi R.; pop. 24,057; engines, furniture; **1804, 1806, 2268.**
**Burlington,** Vt., port and lumber market on L. Champlain; pop. 22,779; lumber products; burial place of Col. Ethan Allen; **3633;** state univ., *picture,* **3631.**
**Burma** (*bûr'mà*), province of Brit. India on e. side of Bay of Bengal; 231,000 sq. mi.; pop. 13,000,000; **540–1,** *maps,* **1744, 232–3;** Bingyi caves, *picture,* **525;** elephants, **1127;** gems, **1409, 1410;** rice-growing, **3015;** teak, **3451;** tungsten, **3548;** woman suffrage, **3779.**
**Burmese people, 540–1, 3227.**
**Burne-Jones, Sir Edward** (1833–98), Eng. painter noted for highly decorative design, **2632, 2329, 471;** 'The Mill', *picture,* **2638.**
**Burner,** gas, **1407;** oil, **1958–9.**
**Bur'net, Gilbert** (1643–1715), Brit. bishop and historian ('History of My Own Time'); quoted, **1557.**
**Burnett** (*bûr-nĕt'*), **Frances Hodgson** (born 1849). Amer. novelist, b. in England ('Little Lord Fauntleroy'; 'The Secret Garden'; 'A Lady of Quality').
**Bur'ney, Fanny** (1752–1840), also known by her married name Mme. D'Arblay, Eng. novelist; her first novel 'Evelina' (1778) made her one of the most famous writers of the day; her 'Letters and Diaries' contain much interesting matter about Dr. Johnson and other literary figures; **1899.**
**Burnham, Daniel Hudson** (1846–1912), Amer. architect and city planner, b. Henderson, N.Y.; planned Chicago World's Fair, **724, 770.**
**Burning.** *See in Index* **Combustion.**
**Burning glass, 1986,** *pictures,* **1987, 1620.**
**Burnley,** England. City in Lancashire 22 mi. n. of Manchester; pop. 105,000; cotton and worsted weaving, iron mfrs.
**Burns, John** (born 1858). First labor member Eng. House of Commons 1892–1918; pres. local govt. board 1905–14, of board of trade 1914; opposed Eng. entrance in World War and retired to private life.
**Burns, Robert** (1759–96), Scotland's greatest poet, **541–2, 3149, 1166,** *pictures,* **542, 1166.**
**Burns, William J.** (born 1861). Amer. detective, b. Baltimore; employed in McNamara dynamiting case (Los Angeles), Schmitz-Ruef case (San Francisco), and many U.S. govt. cases; chief U.S. secret service 1921.
**Burns and scalds,** treatment of, **1269.**
**Burnside, Ambrose Everett** (1824–81), Amer. Civil War general, b. Liberty, Ind.; commanded McClellan's left wing at Antietam; succeeded McClellan in command of Army of Potomac, Nov. 7, 1862; removed after defeat at Fredericksburg, but served as subordinate until end of war; **1361, 2095.**
**Burnt alum, 104.**
**Bur oak, 2547, 2548;** leaf, **3536;** acorn, **3538.**
**Bur'pee, Lawrence Johnston** (born 1873), Canadian historian and author, **625.**
**Burr, Aaron** (1756–1836), 3d vice-president of U.S., **542–3, 1569, 3637.**
**Burr,** of chestnut, *pictures.* **718, 719.**
**Burrhel** (*bûr'ĕl*), a wild sheep, **3199.**
**Bur'roughs, Edgar Rice** (born 1875). Amer. writer of fanciful adventure stories, b. Chicago ('Tarzan of the Apes').
**Burroughs, John** (1837–1921), Amer. nature writer, **543, 115;** quoted, **116, 1053, 3732–3.**
**Burroughs, William S.,** invents calculating machine, **572.**
**Burrow,** of chipmunk, **752;** gopher, **1489;** mole, **2278–9;** prairie dog, **2912;** rabbit, *picture,* **1585.**
**Burrowing owl, 2607.**
**Burslem** (*bûrz'lĕm*), England. Famous pottery town in Staffordshire; pop. 45,000; birthplace of Josiah Wedgwood.
**Burton, Sir Richard Francis** (1821–90), Eng. explorer and writer; translator of 'Arabian Nights'; discovers L. Tanganyika, **3433.**
**Burton, Robert** (1577–1640), Eng. author ('The Anatomy of Melancholy', curious, fantastic book, beloved by Lamb and Samuel Johnson), **1165.**
**Burton-upon-Trent,** England. County borough in Staffordshire and Derbyshire; pop. 50,000; seat of enormous brewing industry
**Buru** (*bụ'rụ*), isl. of Molucca group, Dutch E. Indies, *map,* **1073.**
**Bury, John Bagnell** (born 1861). Irish historian, regius professor of modern history in Cambridge Univ.; edited Gibbon's 'Decline and Fall'; author of histories of Greece and Rome.
**Bury,** England. Town in Lancashire 10 mi. n.w. of Manchester; pop. 57,000; cotton and woolen mfrs., foundries.
**Bury St. Edmunds** or **St. Edmundsbury,** England. Town in W. Suffolk 60 mi. n.e. of London; pop. 17,000; named from Saxon King Edmund; ruins of old Benedictine abbey.
**Busby, Richard** (1606–95). Eng. schoolmaster, head of Westminister School; notorious for unsparing use of the birch.
**"Bush,"** in S. Africa, **3279.**
**Bushel,** a unit of measure, **3715.**
**Bushmaster,** a pit-viper, **3259.**
**Bushmen,** people of S. Africa. **36, 37, 3280,** *picture,* **3283;** insect superstitions, **2386.**
**"Bush negroes," 1547.**
**Bush'nell, David** (1742–1824), invents submarine, **3378.**
**Bush-tit,** a small titmouse, **3506.**

**Bushwhackers,** in Civil War, **781.**
**Business.** For subjects relating to business *see in Index* **Accounts; Banks and banking; Commerce; Economics; Taxation; Transportation,** etc.; and chief industries by name.
**Business letters, 1185.**
**Business schools, 3140.**
**Bus'kin,** shoe worn by Gk. actors, **3484.**
**Busoni** (*bu̯-zō'nē*), **Ferruccio Benvenuto** (born 1866) Ger.-Ital. pianist and composer.
**Bus'ra.** Same as **Basra.**
**Bus'tard,** European and Asiatic bird, **405.**
**Butcher, Samuel Henry** (1850–1910), Brit. classical scholar; translated (with Andrew Lang) Homer's 'Odyssey'; quoted, **1536.**
**Butcher-bird,** or shrike, **3225, 131,** *pictures,* **419, 403.**
**Bute** (*būt*), **John Stuart,** 3d **Earl of** (1713–92), Brit. statesman; supporter of royal autocracy; prime minister 1762–63; influence on George III, **1428.**
**Bute,** isl. of Hebrides, **1625.**
**Butler, Andrew Pickens** (1796–1857), Amer. senator from South Carolina; Sumner attacks, **3392.**
**Butler, Benjamin Franklin** (1818–93), Amer. lawyer, soldier, and politician, b. Deerfield, N.H.; Civil War general; his military administration of New Orleans (1862) was bitterly resented by Confederates, Jefferson Davis proclaiming him a felon to be instantly hanged if captured.
**Butler, Ellis Parker** (born 1869). Amer humorist and writer of boy stories ('Pigs is Pigs'); b. Muscatine, Iowa.
**Butler, John** (d. 1794). Amer. royalist; commanded guerrilla band, chiefly Indians, in Revolution; bitterly hated for part in Wyoming massacre.
**Butler, Joseph** (1692–1752). Eng. bishop, philosopher, and theologian ('Analogy of Religion', famous defense of revealed religion against deists).
**Butler, Nicholas Murray** (born 1862). Amer. educator and politician, b. Elizabeth, N.J.; president of Columbia Univ. since 1902.
**Butler, Samuel** (1612–80), Eng. satirist, author of 'Hudibras', **1165.**
**Butler, Samuel** (1835–1902). Eng. satirical novelist and critic, compared, for biting irony, to Swift ('The Way of All Flesh'; 'Erewhon'; 'Notebooks').
**Butler, William Orlando** (1791–1880). Amer. general, b. Jessamine County, Ky.; served in War of 1812; member of Congress 1839–43; commanded army in Mexican War (1848).
**Butler,** Pa. City 30 mi. n. of Pittsburgh, in coal, iron, natural gas, and oil region; pop. 23,778; glass, iron and steel, r.r. cars, oil-well supplies.
**Butler College.** At Irvington, a suburb of Indianapolis, Ind.; coed.; organized 1855; collegiate work, normal course, art.
**Butte** (*būt*), Mont., 47 mi. s.w. of Helena; largest city in state; pop. 41,611; in rich copper, silver, and gold mining region and site of famous Anaconda mine; state school of mines; **2309, 2312, 882.**
**Butte,** a hill, **2791.**
**Butter, 543–4, 952;** Australia, **264;** butter-fat, **950, 952, 2238–9, 1225;** churn, *pictures,* **951, 2734;** cocoa butter, **756;** Denmark, **996;** food value, **1320–2;** New Zealand, **2499;** Netherlands, **2440;** Siberia, **3228;** S. Africa, **3283;** substitutes, **2577–9, 820;** Sweden, **3404;** U.S., **953;** vitamins, **3651.**
**Butter-and-eggs,** a plant, **2417.** *See also in Index* **Toadflax.**
**Buttercup,** a plant, **544, 2854.**
**Buttercup, Little.** In Gilbert and Sullivan's opera 'Pinafore', bumboat woman and former baby-farmer who changed the Captain and Ralph Rackstraw as babies.
**Butterfly, 544–8, 1788,** color plate **548–9;** caterpillars, **546, 660–2, 1964, 1785–6;** chrysalis stage, **546, 2936, 1786;** eggs, *pictures,* **547, 1091;** leaf, *pictures,* **1785, 2925;** protective coloration, **2924;** Pasha caterpillar, *picture,* **660;** skipper, *picture,* **2416.** *See also in Index* **Moth.**
**Butterfly fish, 1277,** *picture,* **1271.**
**Butterine,** or oleomargarine, **2577–9.**
**Buttermilk, 2239.**
**Butternut,** or white walnut tree, **548, 2545, 3533.**
**Butterworth, Hezekiah** (1839–1905). Amer. writer of children's stories and verses, b. Warren, R.I. ('Zig-Zag Journeys').
**Buttonholes,** how to make, **3185.**
**Buttons, 548–50;** condensite, **816;** industry in Iowa, **1806;** mussel shells, **783;** sewing, **3184.**
**Buttonwood,** or sycamore, **3424.**
**But'tress,** in architecture, **181, 184, 186,** *pictures,* **186, 1199.**
**Butyric** (*bū-tir'ik*) **acid, 1232.**
**Buyuk-Jami,** Sofia mosque, **3272.**
**Buzancy** (*büz-ōⁿ-sē'*). Fr. town 26 mi. n.w. of Verdun; first major objective of Meuse-Argonne attack; occupied by Americans Nov. 3, 1918.
**Buz'zard** (turkey-buzzard), **550–1,** *pictures,* **415, 410.**
**Buzzard hawk, 1606;** altitude range, *picture,* **397.**
**Buzzards Bay,** Mass., **2449,** *map,* **2166;** canal, **627;** scientific school, **42.**
**Bydgoszez.** Same as **Bromberg.**
**Byelostok.** Same as **Bialystok.**
**Byng** (*bing*), **Julian Hedworth George,** first **Baron** (born 1862), Brit. general; served in Sudan expedition, Boer War, and World War; appointed gov.-gen. of Canada in 1921; in World War, **941.**
**Byn'ner, Witter** (born 1881). Amer. poet and playwright, b. Brooklyn ('Grenstone Poems'; 'A Canticle of Pan').
**Byrd** (*bûrd*), **Colonel William** (1674–1744), Amer. lawyer, b. Westover, Va.; founds Richmond, **3019.**
**By'ron, George Gordon, Lord** (1788–1824), Eng. poet, **551, 1166, 1645,** *picture,* **1167.**
**Bytown,** Canada, early name of Ottawa, **2605.**
**Byzan'tine art and architecture, 552, 178–9, 2628,** *pictures,* **182, 183, 1197;** mosaic, *picture,* **2630.**
**Byzantine Empire,** also called **Eastern** or **Greek Empire** (395–1453 A.D.), **551–2;** barbarian invasions, **1491–2;** Crete, **918;** Crusaders take Constantinople (1204), **932, 552, 3625;** division of the Rom. Empire (395 A.D.), **3048, 552;** Eastern Orthodox church, **2994, 763;** exarchate of Ravenna, **2979;** Justinian, **1905, 552, 3618;** Sicily, **3230;** Turks take Constantinople (1453), **552, 871, 3559;** Venice, **3624.**

CHIEF BYZANTINE RULERS

| | |
|---|---|
| 395-408 | Arcadius |
| 408-450 | Theodosius II |
| 450-457 | Marcianus |
| 457-474 | Leo I |
| 474-491 | Zeno |
| 491-518 | Anastasius I |
| 518-527 | Justinus I |
| 527-565 | Justinian I |
| 565-578 | Justinus II |
| 578-582 | Tiberius II, Constantinus |
| 582-602 | Mauricius |
| 602-610 | Phocas |
| 610-641 | Heraclius |
| 642-668 | Constans II |
| 668-685 | Constantine IV |
| 685-695 | Justinian II |
| 695-697 | Leontius |
| 697-705 | Tiberius III, Apsimarus |
| 705-711 | Justinian II (restored) |
| 711-713 | Philippicus |
| 713-715 | Anastasius III, Artemius |
| 715-717 | Theodosius III |
| 717-740 | Leo III, the Isaurian |
| 740-775 | Constantine V, Copronymus |
| 775-779 | Leo IV |
| 779-797 | Constantine VI |
| 797-802 | Irene |
| 802-811 | Nicephorus I |
| 811-813 | Michael I, Rhangabe |
| 813-820 | Leo V, the Armenian |
| 820-829 | Michael II, the Amorian |
| 829-842 | Theophilus |
| 842-867 | Michael III |
| 867-886 | Basil I, the Macedonian |
| 886-912 | Leo VI, the Wise |
| 912-958 | Constantine VII, Porphyrogenitus |
| 958-963 | Romanus II |
| 963-1025 | Basil II, Bulgaroktonos |
| 1025-28 | Constantine VIII |
| 1028-34 | Romanus III, Argyrus |
| 1034-42 | Michael IV, the Paphlagonian |
| 1042-55 | Constantine IX, Monomachus |
| 1055-57 | Theodora |
| 1057-59 | Isaac I, Comnenus |
| 1059-67 | Constantine X, Ducas |
| 1067-78 | Michael VII, Ducas |
| 1078-81 | Nicephorus III, Botaniates |
| 1081-1118 | Alexius I, Comnenus |
| 1118-43 | John II, Comnenus |
| 1143-80 | Manuel I, Comnenus |
| 1180-83 | Alexius II, Comnenus |
| 1183-85 | Andronicus I, Comnenus |
| 1185-95 | Isaac II, Angelus |
| 1195-1203 | Alexius III, Angelus |
| 1203-04 | Isaac II (restored) jointly with Alexius IV |
| 1204 | Alexius V, Ducas |
| 1204-22 | Theodore I, Lascaris |
| 1222-54 | John III, Ducas |
| 1254-59 | Theodore II, Ducas |
| 1259-60 | John IV, Ducas |
| 1260-82 | Michael VIII, Palaeologus |
| 1282-1328 | Andronicus II, Palaeologus |
| 1328-41 | Andronicus III, Palaeologus |
| 1341-91 | John V, Palaeologus |
| 1391-1425 | Manuel II |
| 1425-48 | John VII |
| 1448-53 | Constantine XI |
| [1453 | Capture of Constantinople by the Turks and fall of the Byzantine Empire.] |

**Byzantium** (*bi-zăn'shi-ŭm*), anc. Gk. city on site of Constantinople, **871, 3048.**

# C

WE might call C a royal letter, not only because it stands for the word "crown" in English, but because in the hieroglyphic writing of ancient Egypt it was a throne In its simplified form it looked more like a camel with its hump The Phoenicians and Hebrews called it *Gimel*, which was their word for "camel," and wrote it Among the Greeks this same *Gimel* became *Gamma;* a little Greek said his A B C's like this: *Alpha, Beta, Gamma.* By this time the camel had turned around and the hump had become a right angle, so that it looked like this Then gradually it became transformed into the rounding letter C. Its sound was a hard *g* (as in "go"), but the Romans afterwards gave it the sound of *k*. In Anglo-Saxon or Old English, *c* had the sound of *k*, but it was gradually changed to *ch* before *e* and *i*. In the English of today, it still has the sound of *k* before *a, o, u*, and before any consonant other than *h*. Before *e, i*, or *y* we give it the *s* or *sh* sound. As a matter of fact C isn't really needed in the alphabet nowadays, since all its various sounds can be represented by other letters, but nevertheless it is still one of the most popular of the letters, as you may see from the number of pages in this section of the Fact-Index.

**Cabal** (*kȧ-băl'*). Unpopular Eng. ministry (1667–73) under Charles II composed of Clifford, Ashley, Buckingham, Arlington, and Lauderdale, whose initials formed the word.
**Cabala** (*kăb'ȧ-lȧ*), mystical interpretation of Scriptures, **1625.**
**Caballero** (*kä-bäl-yā'rō*), **Fernán,** pen name of Cecilia Böhl de Faber (1796–1877), Span. novelist, b. Switzerland ('La Gaviota'), **3308.**
**Cabbage, 553–5;** cause of odor, **3389;** food value, **1321;** vitamins, **3652;** when and how to plant, **1397.**
**Cabbage butterfly, 546.**
**Cabbage family** of plants, **554–5.**
**Ca'bell, James Branch** (born 1879). Amer. novelist, b. Richmond, Va. ('The Cream of the Jest'; 'Figures of Earth'; 'Jurgen').
**Cabeza de Vaca** (*kä-bā'thä*), **Alvar Nuñez** (1490?–1564?), Span. adventurer, shipwrecked in Narvaes' last expedition; in Texas, **3478;** route, *picture-map,* **3474.**
**Cabin'da,** Africa, **860,** *map,* **859.**
**Cabinet,** in govt., the heads of departments who act as advisers to the chief executive of a country or state; British, **555, 2689;** Canadian, **620, 621;** U.S., **555, 3595–6, 2914, 862.**
**Cabinet organ, 2600.**
**Cable, George Washington** (born 1844), Amer. novelist, b. New Orleans ('The Grandissimes'; 'Old Creole Days'; 'Strange True Stories of Louisiana'—stories of old plantation days), **114.**
**Cable railway, 3371.**
**Cables, submarine, 556–61;** Atlantic lines, **560–1,** *picture-map,* **255;** Kelvin, **557–8;** longest continuous, **561;** Samuel F. B. Morse, **2330;** Pacific, **561;** sending a message, *picture,* **3456;** speed of messages, **558;** Telegraph Plateau, **254, 561.**
**Caboose,** r.r. car, **2966.**
**Cab'ot, George** (1751–1823). One of Federalist leaders in Mass.; president of Hartford Convention and member of Essex Junto.
**Cabot, John** (1450–98), Ital. explorer sailing under Eng. flag, **561–2, 616, 2450, 1690;** lays foundation of Brit. claims to N. Amer., **1635;** *map* of voyages, **110.**
**Cabot, Sebastian** (1476–1557), explorer, son of John, **562, 1690;** Plata R. exploration, **192.**
**Cabra** (*kä'brä*), Spain. Old town 35 mi. s.e. of Cordova; pop. 12,200; captured from Moors 1240; recaptured by them 1331.
**Cabral** (*kä-brăl'*) or **Cabrera** (*kȧ-brā'rȧ*), **Pedro Alvarez** (1460?–1526), Port. navigator; bound to E. Indies, accidentally carried out of course to Brazil (1500); **496;** *map* of voyage, **110.**
**Cabrera** (*kä-brā'rä*), one of Balearic Isles, **307.**
**Cabrillo** (*kȧ-brēl'yō*), **Juan Rodriguez** (d. 1543), Port. navigator, **580.**
**Cacao** (*kä-kä'ō*), tropical Amer. tree whose seeds yield chocolate and cocoa, **562, 755–6;** tea made from leaves, **3451;** where grown, **562, 836, 859, 1069, 1079.**
**Cachalot** (*kăsh'ȧ-lŏt*), a sperm whale, **3726.**
**Cacique** (*kä-sēk'*), an official of the Aztecs, **289.**
**Cactus** (*kăk'tŭs*), leafless desert plant, **562–3;** adaptation to desert life, **2829, 1207;** in Arizona, **202;** "thornless," **538,** *picture,* **539.**
**Cad'dis fly,** *picture,* **1786.**
**Cade** (*kād*), **John** (d. 1450), Eng. peasant rebel; character in Shakespeare's 'King Henry VI' leads rebellion, **1634.**
**Cadets,** U.S. Military Academy, **2236–7;** Naval Academy, **2418–9.**
**Cadi** (*kä'di*), a judge in a Mohammedan court; in Algeria, **96.**
**Cadillac** (*kăd-ĭ-lăk'*), **Antoine de la Mothe** (d. 1720?); Fr. commander and pioneer in America; founds Detroit, **999, 2226.**
**Cadiz** (*kā'dĭz*), Spain, seaport and naval station on Atlantic 50 mi. n.w. of Strait of Gibraltar; pop. 65,000; exports wine, fruit, oil; bay, **3299;** founded by Phoenicians, **3302, 2774;** Drake attacks, **1031, 210;** Raleigh at, **2975.**
**Cadme'a,** acropolis of anc. Thebes, **3485.**
**Cadmium,** a chemical element, **4042;** in alloys, **428.**
**Cadmus** (*kăd'mŭs*), in Gk. myth., founder of Thebes, **563, 3485.**
**Cadore** (*kä-dō'rē*) or **Piave di Cadore,** Italy, small town on Piave R. 22 mi. n.e. of Belluno; birthplace of Titian, **3504.**
**Cadorna** (*kȧ-dôr'nȧ*), **Luigi, Count** (born 1850). Ital. general, chief of general staff 1914–17, commander-in-chief of Ital. armies in field 1915–17; replaced by Diaz following defeat at Caporetto.
**Caduceus** (*kȧ-dū'sĕ-ŭs*), in Gk. myth., magic wand of Hermes, **1644.**
**Caedmon** (*kăd'mŏn*) (d. 680), earliest Eng. Christian poet, **563, 389, 1163.**
**Caelian** (*sē'lĭ-ȧn*) **Hill,** Rome, **3056.**
**Caen** (*käṅ*), city of n.w. France; pop. 47,000; trade in Caen stone; makes Angora gloves; **2513, 1350.**
**Caerleon** (*kär'lĕ-ŏn*), England. Town on Usk R. near border of s. Wales; as Isca Silurum, important Rom. station; traditional site of Camelot, seat of King Arthur's court.
**Caesar** (*sē'zär*), **Caius Julius** (102–44 B.C.), Rom. general, statesman, and author, **563–5, 3046, 3049,** *picture,* **3043;** in Britain, **1152;** reforms calendar, **574, 257, 971, 1902;** Cleopatra, **789;** Gallic wars, **1352, 1445;** place in Latin literature **1966–7;** and Pompey, **2878.**
**Caesarea** (*sĕs-ȧ-rē'ȧ*) or **Caesarea Mazaca.** Anc. town in Asia Minor; cap. of kings of Cappadocia; destroyed by Persians 260 A.D.; pop. then 400,000; modern town Kaisarieh, most important trade center in e. Asia Minor.
**Caesarea** or **Caesarea Palestina.** Seaport in anc. Palestine on Mediterranean 55 mi. n.w. of Jerusalem; built by Herod; modern village, Kaisarieh, has many Rom. ruins.
**Caesarea Philippi.** Anc. town in Palestine on Jordan R. at foot of Mt. Hermon; here Jesus gave his charge to Peter (Matt. xvi. 13).
**Caesium** (*sē'zi-ŭm*), a chemical element, **4042.**
**Café** (*kä-fā'*), **822.**
**Café au lait, 823.**
**Caffeine** (*kăf'ē-ĭn*), in tea and coffee, **3446, 823;** an alkaloid, **3450, 10;** causes sleeplessness, **3251.**
**Cagliari** (*kä'lyȧ-rē*), Italy, cap. and chief city of Sardinia, on s. coast; pop. 61,000; Rom. amphitheater; province, **3127.**
**Cagliostro** (*kä-lyōs'trō*), **Alessandro** (1743–95). Assumed name of Joseph Balsamo, Ital. charlatan, implicated in the Diamond Necklace affair.
**Caho'kia,** Ill., **1736;** Clark captures, **783;** Pontiac murdered, **1772.**
**Cahokia Mound, 2357, 1731.**
**Caiaphas** (*kā'ȧ-făs*). Jewish high priest, before whom Jesus was arraigned before the crucifixion (John xviii, 13–14, 24).
**Caillaux** (*kȧ-yō'*), **Joseph M. A.** (born 1863). Fr. premier 1911–12; imprisoned 1917–20; banished for five years (1920–25) for treasonable communication with the Germans; his wife killed (1914) Gaston Calmette, editor of *Figaro,* for printing virulent attacks against Caillaux.
**Cain** (*kān*). Adam and Eve's first-born son, slayer of his brother Abel (Gen. iv).
**Caine, Sir Hall** (born 1853). Prolific Eng. novelist and dramatist;

stories are melodramatic with strong religious tone; ('The Manxman'; 'The Christian'; 'The Eternal City'; 'The Woman Thou Gavest Me'; 'Master of Man').

**Cairngorm** (*kērn'gôrm*), semi-precious stone, **2945.**

**Cairo** (*kī'rō*), Egypt, largest city in Africa; pop. 800,000; on Nile R.; **566–70,** *picture,* **32;** center of Saracen culture, **2278;** rail connections, **567, 2645–6;** university, **566,** *picture,* **569.**

**Cairo,** Ill., port and r.r. center in s. at junction of Mississippi and Ohio rivers; pop. 15,203; shipping point for farm produce and lumber; various mfrs.; **1732, 2263.**

**Caisson** (*kā'sŏn*). A type of artillery ammunition wagon.

**Caissons, pneumatic,** in building, **530–1, 1014.**

**Caius Caesar,** Rom. emperor. *See in Index* **Caligula.**

**Cajamarca** (*kä-hä-mär'kä*), Inca city, **2814.**

**Caj'etan** (1470–1534), general of the Dominicans; created cardinal 1517; and Luther, **2085.**

**Cal'abash,** a S. African gourd, **1492.**

**Calabria** (*kä-lā'brĭ-ȧ*), name given until 11th cent. to s.e. Italy (the heel); now to 3 provinces in s.w. (the toe); earthquake, **1066;** people, **1841.**

**Cala'dium,** ornamental plant with large "arrow-head" leaves; stem structure, **3700.**

**Calais** (*kȧ-lā'*), France, seaport on Strait of Dover; pop. 75,000; **570–1;** cable to Dover, **560;** in Hundred Years' War, **1700, 1634;** England loses, **2157;** Ger. objective in World War, **3792.**

**Cal'amine,** a zinc ore, **3840.**

**Cal'amus,** or sweet-flag plant; spicy rootstock, **3317.**

**Calamus,** a split-reed pen, **2709.**

**Calamus,** rattan palms, **2647.**

**Calcarea** (*kăl-kā'rē-ȧ*), class of sponges with limy skeletons, **3944.**

**Calcasieu** (*kăl'kȧ-shų*) **River.** Rises in w.-cent. La. and flows s. 200 mi. to Gulf of Mexico; widens near mouth to form L. Calcasieu.

**Cal'cimine** (*kăl'sĭ-mĭn*), water paint, **2642.**

**Calcite** (*kăl'sīt*), or calcium carbonate, **571;** crystal, *picture,* **935;** Iceland spar, **571, 1724;** limestone forms, **2010;** relative hardness, **2248.**

**Calcium** (*kăl'sĭ-ŭm*), a metallic element, **571, 4042;** in bones, **452;** needed by plants, *picture,* **2821;** phosphorescent compounds, **2776;** prevalence, **711,** *picture.* **1058;** in protoplasm, **394;** makes water "hard," **3696.**—*Compounds:* carbide, **571, 8, 1383, 2512;** carbonate (calcite and limestone), **571, 2010, 1724,** *picture,* **935;** chloride, **1362;** cyanamide, **571, 2512, 1235;** hydroxide (slaked lime), **2010;** nitrate, **3118, 1235, 2776;** oxide (quicklime), **2010;** sulphate, **571, 1554;** sulphide, **3272, 2776.**

**Calcium light** or **lime light, 2010.**

**Calculating machines,** machines for mathematical computations, **571–2, 196;** cash registers, **653;** census recording, **677, 678.**

**Cal'culus,** branch of mathematics, **2174, 2476.**

**Calcutta** (*kăl-kŭt'ȧ*). India, largest city in India; cap. of Bengal; pop. 1,225,000; 80 mi. from Bay of Bengal on Ganges R.; **572–3, 1393;** famous banyan tree, **329;** 17th cent. trading post, **1752–3;** university, **1756.**

**Calderón** (*käl-dā-rōn'*) **de la Barca, Pedro** (1600–81), Span. dramatist, **3307, 1034;** chief works, **1038.**

**Caldwell,** N.J., post borough 8 mi. s.w. of Paterson; Cleveland's birthplace, **789.**

**Caledo'nia.** Name given by Romans to Scotland; now used poetically.

**Caledonian Canal,** Scotland, **3146.**

**Caledonians,** people, **3147.**

**Calendar** (*kăl'ĕn-dȧr*), in reckoning time, **573–5;** Aztec, **290,** Calendar Stone, *picture,* **289;** Babylonian, **296;** day, **969;** debt to astronomy, **239;** determining time, **3500–2;** anc. Egypt, **1099;** Fr. changes during Revolution, **1370;** Gk. Olympiad, **2580;** Jewish New Year, **2479;** mistake in dating birth of Christ, **573–4, 1887;** Mohammedan, **2276;** month, **2317;** New Year's Day, **2478;** "perpetual," **574;** Sabbath, **3103;** week, **3713.** *See in Index* **Time;** also the names of the months.

**Calendar Stone,** Aztec, *pictures,* **289, 2216.**

**Calender,** for glazing paper, **2668, 2673.**

**Calen'dula,** the marigold, **2148.**

**Calf,** young of cattle and other ruminants; moose and caribou, **979.**

**Calfskin, 1977;** parchment and vellum, **2667.**

**Calgary** (*kăl'gȧ-rĭ*), Alberta, leading inland city of Canadian Northwest; pop. 65,000; **575, 82.**

**Calhoun', John Caldwell** (1782–1850), Amer. statesman and orator, **575–6;** advocates War of 1812, **785, 575;** expounds state sovereignty, **3292;** succeeded by Jefferson Davis, **967;** vice-president, **3636, 1856.**

**Cali** (*kä-lē'*). Colombia. Commercial center in s.w. on branch of Cauca R.; pop. 46,000; r.r. to Pacific port Buenaventura.

**Caliban** (*kăl'ĭ-băn*), in Shakespeare's 'Tempest', deformed savage son of a witch and a devil, enslaved by Prospero, **3465.**

**Caliber,** or gage, of firearms, **1256.**

**Calico, 804, 904;** printing, **804, 1986.**

**'Calico Horse, The Luck of the',** a story, **1686–7.**

**Calicut** (*kăl'ĭ-kŭt*), India, port on s.w. coast; pop. 79,000; **1745;** gave name to calico, **804;** visited by Vasco da Gama, **1393.**

**Calif** (*kā'lĭf*) or **caliph,** civil and religious head of a Mohammedan state, **2276, 2278, 3557.**

**California** (*kăl-ĭ-fôr'nĭ-ȧ*), a Pacific state of U.S.; 158,297 sq. mi.; pop. 3,426,861; cap. Sacramento; **576–87,** *maps,* **577, 578;** apricots, **161, 162;** asphalt, **235;** borax, **464;** canning industry, **633;** chief cities, **576, 2062–3, 3103, 3123–4, 3124–5;** climate, **577, 581;** coöperative societies, **879;** cotton, **904;** dates, **966;** Death Valley, **970;** education, **580;** figs, **1237;** fossils, **1336;** Franciscan mission, *picture,* **2301;** fruits, **1379;** gold, **578, 1479,** *picture,* **1039;** grapes, **1501–2;** Indians, **1767;** irrigation, **1829, 1830;** lemons, **1985;** mercury, **2200;** motion-picture industry, **2344, 2346, 2063;** Muir Woods, **2400;** origin and meaning of name, **3347;** national parks, **2399, 2400, 3831–2;** olives, **2579;** oranges, **2588,** *picture,* **2589;** ostrich farming, **2603;** petroleum, **2754, 2063,** *picture.* **2753;** population, **580, 582;** potash, **2900;** raisins, **582;** sequoia, **3175–6;** Sierra Nevada, **3231;** state flower, **3347;** sun-curing tobacco, *picture.* **3509;** Mt. Whitney, **3736, 576;** Yosemite Valley, **3831–2,** *picture,* **2403.** —*History,* **580–1;** first settlement, **3124;** in Mexican War, **2207, 2208;** ceded to U.S.; **2872, 2208;** gold rush, **3103;** Compromise of 1850, **855, 3444;** story, 'How Alice Rode to the Golden Gate', **582–7.**

**California, Gulf of,** arm of Pacific Ocean 700 mi. long between Lower California and mainland of Mexico; **2619, 587,** *map.* **2209.**

**California, Lower,** peninsula of Mexico between Pacific and Gulf of California and Colorado R.; 58,343 sq. mi.; pop. 52,244; **587;** *maps,* **2514–5, 2209;** discovered by Cortez, **895;** pearl fisheries, **2703;** why it lacks rain, **2973.**

**California, University of,** at Berkeley, Calif.; co-ed.; state institution; established 1868 (California College chartered 1860); letters, sciences, engineering, law, education, architecture, agriculture; **580;** Lick Observatory, **2552.**

**California, Valley of, 3581.**

**California gull, 1550.**

**California Institute of Technology.** At Pasadena, Calif.; men; founded 1891 (as Throop Polytechnic Institute); civil, electrical, mechanical, and chemical engineering.

**California privet, 1627.**

**California quail, 2943.**

**California sardine, 3126.**

**California vulture, 3662;** head, *picture,* **410.**

**California yew, 3830.**

**Caligula** (*kȧ-lĭg'ų-lȧ*) ("Little Boot"), nickname of Caius Caesar (12–41 A.D.); Rom. emperor, succeeded 37 A.D.; tyrannical and insanely cruel; assassinated; **3047.**

**Cal'iper beetle,** *picture,* **367.**

**Calix'tus II** (d. 1124). Pope, concluded Concordat of Worms with Henry V (1122).

**Calix'tus III** (d. 1458), pope, **467.**

**Cal'la lily, 2009, 3939.**

**Callao** (*kä-lä'ō*), chief port of Peru 6 mi. w. of Lima; pop. 35,000; excellent harbor; exports sugar, cotton, minerals, wool; **2744, 2009.**

**Callimachus** (*kă-lĭm'ȧ-kŭs*). Gk. lyric poet of 3d cent. B.C., **1538.**

**Calliope** (*kă-lī'ō-pē*), in Gk. myth., muse of epic poetry, **2373,** *picture,* **156.**

**Callisto** (*kă-lis'tō*), nymph changed to constellation by Zeus, **872.**

**Calmar.** Same as **Kalmar.**

**Calms, belt of, 3750.**

**Cal'omel,** mercurous chloride, **2200.**

**Calor'ic,** fluid once assumed to be cause of heat, **1617;** theory disproved, **1618, 1249.**

**Calory** (*kăl'ō-rĭ*) or **calorie,** heat unit, **587, 1620;** "greater," as measure of food value, **1320.**

**Caloso'ma beetle,** *pictures,* **368.**

**Calpur'nia,** wife of Julius Caesar; warns Caesar, *picture.* **565.**

**Caltanissetta** (*käl-tä-nē-sĕt'tä*). City in Sicily; pop. 43,000; center of sulphur industry.

**Cal'umet,** Mich. Township on Upper Peninsula, 68 mi. n.w. of Marquette; pop. 22,369; center of great copper-mining district.

**Calumet.** The "peace-pipe" of N. Amer. Indians; tobacco-pipe with stone bowl and long reed stem ornamented with eagles' feathers; smoked on ceremonial occasions, especially in making treaties of peace.

**Calumet and Hecla Mine, 881.**

**'Calumny',** poem by Frances S. Osgood, **3247.**

**Cal'vary** or **Golgotha,** the place where Jesus was crucified, **1886, 1888.**

**Calvé** (*käl-vā'*), **Emma** (1864-1921). Fr. operatic singer of great dramatic power; famous 'Carmen'.

**Cal'verley, Charles Stuart** (1831–84). Eng. humorous poet and barrister ('Fly Leaves').

**Calvert, Barons Baltimore.** *See in Index* **Baltimore.**

**Calvert** (*kăl'vērt*), **Leonard** (1582?–1674). First colonial governor of Md., brother of Cecilius, 2d Lord Baltimore.

**Calvi** (*käl'vē*), small seaport in n.w. Corsica; battle of, **2435.**

**Calvin, John** (1509–64), Swiss theologian and reformer, **587;** on Puritans, **2937;** on Knox, **1941;** influence on Fr. literature, **1364, 2987, 2988, 1412.**

**Calvinists, 3488, 3489, 3774.**

**Calypso** (*kȧ-lĭp'sō*), in Gk. myth., nymph who detained Odysseus for seven years, **2563.**

**Calyx** (*kā'lĭks*), sepal structure of flower, **1305.**

**Cam** (*kăn*), **Diogo,** Port. explorer of 15th cent., **858.**
**Cam.** River in Cambridgeshire, England; 40 mi. long, emptying into Ouse.
**Cam,** in machinery, **282, 1404.**
**Camagüey** (*kä-mä'gwā*). Largest inland city of Cuba, 170 mi. n.w. of Santiago de Cuba; pop. 98,000; exports cattle products.
**Cambay',** India. City 240 mi. n. of Bombay on Gulf of Cambay, inlet of Arabian Sea; pop. 32,000; jewelry mfrs., cotton exports.
**Camberwell,** England. Metropolitan borough of s. London; pop. 267,000; Camberwell green once celebrated for fairs.
**Cam'bium,** "growth layer" between bark and wood of trees, **330, 3530–2.**
**Cambo'dia,** province in s.w. Fr. Indo-China on lower Mekong R.; 45,000 sq. mi.; pop. 2,000,000; cap. Pnompenh; **1777.**
**Cambrai** (*kän-brā'*) or **Cambray,** France, city 35 mi. s. of Lille; pop. 22,000; linen goods, especially cambric, to which it gave name; in World War, **3797, 3806, 3810.**
**Cambrai, League of,** alliance of Louis XII of France, Emperor Maximilian I, Ferdinand the Catholic of Spain, and Pope Julius II for partition of Venetian territories (1508); **3625, 1902.**
**Cambrian Mts.,** highlands of Wales, *map,* **1152–3.**
**Cam'brian period,** in geology, **1418,** *picture,* **1419.**
**Cambric** (*kām'brĭk*). A fine linen fabric; now also kind of cotton cloth made to imitate linen.
**Cambric tea, 3451.**
**Cam'bridge,** England, seat of Univ. of Cambridge, on Cam R. 50 mi. n. of London; pop. 60,000; **1160.**
**Cambridge,** Mass., suburb of Boston; pop. 109,694; seat of Harvard Univ.; **587–8;** famous settlers, **2165;** first printing in N. Amer., **2168;** scenes in, *pictures,* **833, 1138.**
**Cambridge,** Ohio. City 75 mi. e. of Columbus; pop. 13,104; coal, iron, and pottery clay deposits which form basis of numerous mfrs.
**Cambridgeshire.** Agricultural county in e. England; 859 sq. mi.; pop. 203,000; county seat Cambridge.
**Cambridge University,** famous center of learning, Cambridge, England; secured charter from Henry III (1231); consists of 20 colleges; **832, 1160;** boat-racing, *picture,* **445;** religious qualifications removed, **1468.**
**Cambunian Mts.,** Greece. Range in n. Thessaly intersecting the Pindus Mts. on the w. and culminating in Mt. Olympus on the e.
**Cambyses** (*kăm-bī'sēz*) **III** (d. 522 B.C.), son of Cyrus the Great; king of Medes and Persians 529–522 B.C.; conquers Egypt, **2737.**
**Cam'den,** N.J., port and r.r. center on Delaware R. opposite Philadelphia; pop. 116,309; market gardens, ships, talking machines, canned goods; **2458.**
**Camden,** S.C., town 32 mi. n.e. of Columbia, **3290;** battle of (1780), **987, 1409, 3004.**
**Camden Town,** district of London, **2056.**
**Camel** (*kăm'ĕl*), ruminant desert animal, **588–91,** *pictures,* **46, 233, 1097, 1742, 1746;** in Australia, **269;** caravans, **3105–6,** *picture,* **233;** foot, *picture,* **1323;** prehistoric, **1334, 1336;** stomach, **3082–3.**
**Camel family,** the **Camelidae;** includes camels, **588–91,** alpaca and vicuña, **100;** llama, **2039.**
**Camellia** (*kä-mēl'i-ä*), a shrub, **591.**
**Camel'opard,** anc. name for giraffe, **1464.**
**Camelot** (*kăm'ĕ-lŏt*), legendary seat of King Arthur's court, **3069, 3070.**
**Camembert** (*kä-mäñ-bĕr'*) **cheese, 709.**
**Cameo** (*kăm'ē-ō*), engraved gem or sea shell bearing design cut in relief; opposed to intaglio; **591, 3202.**
**Cam'era, 591, 2778–80, 2782;** early type, *picture,* **1798;** lens, **1986–8;** motion picture, **2348,** *picture,* **2352;** used with microscope, *picture,* **474.** *See also in Index* **Photography.**
**Camera obscura, 591.**
**Cam'eron, George H.** (born 1861), major-general (temporary rank); commanded 5th Corps, A.E.F., 1918; **194, 3110.**
**Cameroon'** or **Kamerun',** a region in w.-cent. Africa (298,000 sq. mi.), formerly a German protectorate; since 1919 divided between France and Gt. Brit.; palm products, rubber, ivory, cocoa; *map,* **40–1;** acquired by Germany, **40;** Allies capture, **3796.**
**'Camille'** (*kä-mēl'*), play by Dumas, **1048.**
**Camil'lus, Marcus Furius** (d. 365 B.C.). Rom. general, dictator in war against Veii 396 B.C.
**Camino Real** (*kä-mē'nō rā-äl*), or King's Highway, **3024.**
**Camoens** (*kăm'ō-ĕns*), **Luis Vaz de** (1524–80), greatest Portuguese poet; largely fixed language; developed lyric poetry and greatly influenced national drama ('The Lusiads', great national epic of discovery); **2889.**
**Camomile** (*kăm'ō-mīl*) or **chamomile.** An herb (*Anthemis nobilis*) of the aster family cultivated for various medicinal uses; both flowers and leaves have strong aromatic odor and bitter taste.
**Camor'ra,** Ital. secret organization, **2391, 1840.**
**Camouflage** (*kä-mo͝o-fläzh'* or *kăm'o͝o-fläzh*), art of disguising or concealing in warfare, **591;** camouflaged trench, *picture,* **3791;** principles adapted from animals, **2924.**
**Campagna** (*käm-pä'nyä*) **di Roma,** large uncultivated plain around Rome, made malarial by Tiber inundations and marshes; now under reclamation; **1835, 3040.**
**Campania** (*käm-pä'nyä*), Italy, dept. on s.w. coast; chief city, Naples; 6277 sq. mi.; pop. 3,500,000; charming climate and scenery; very fertile; **1835, 1841.**
**Campanile** (*kăm-pȧ-nē'lĕ*). *See in Index* **Bell-tower.**
**Campanini** (*käm-pä-nē'nē*), **Cleofonte** (1860–1919). Ital. musical director, manager of Chicago and Philadelphia opera companies.
**Campanulales** (*kăm-păn-yu-lā'lēz*), highest order of plants, **3943.**
**Campbell, Alexander** (1788–1866). Irish-Amer. theologian; founder with his father Thomas (1763–1854) of Disciples of Christ (Campbellites); also founder of Bethany College, W. Va.
**Campbell, Sir Colin** (Lord Clyde) (1792–1863), Brit. general; served in Peninsular War, Crimean War, and Sepoy Mutiny; recaptures Lucknow, **2075.**
**Campbell, Thomas** (1777–1844). Scotch poet now best known for his stirring lyrics ('Hohenlinden'; 'Ye Mariners of England'; 'Lord Ullin's Daughter'; 'The Battle of the Baltic').
**Campbell, William Wilfrid** (born 1861), Canadian poet; retired from Episc. ministry for literary work ('Lake Lyrics'; 'Sagas of Vaster Britain'; also novels); **624.**
**Campbell-Bannerman, Sir Henry** (1836–1908), Brit. Liberal leader; premier (1905–08); **2039.**
**Campbell Islands,** small uninhabited group s. of and belonging to New Zealand, **2500.**
**Camp'bellites,** name popularly applied in U.S. to the religious body properly known as the Disciples of Christ; founded by Alexander Campbell; **2994.**
**Campeche** (*kăm-pē'chē*) or **Campeachy,** Mexico, state on w. side of Yucatan peninsula; 18,089 sq. mi.; pop. 87,000; cap. Campeche (pop. 17,000); **3834;** logwood, **2047.**
**Camp'perdown,** Netherlands. Village on North Sea 27 mi. n.w. of Amsterdam; Brit. naval victory over Dutch (1797).
**Camp Fire Girls, 592–4.**
**Camp fires,** how to make, **597–9.**
**Camphor** (*kăm'fôr*), an aromatic gum-like substance, **594;** Borneo, **468;** celluloid, **673;** Formosa, **1332,** Japan, **1866;** tree related to laurel, **1970.**
**Camping, 594–9.**
**Camp Meade,** U.S. national army camp 15 mi. n.w of Annapolis, Md., established for training troops in World War, **3802.**
**Campo Formio** (*käm'pō fôr'mi-ō*), Italy, market town 60 mi. n.e. of Venice; treaty of (1797), **2393.**
**Camp olive shell,** *picture,* **3203.**
**Campo Santo** (*käm'pō sän'tō*), name meaning "holy field" applied to burial grounds in Italy; at Genoa, *picture,* **1847;** Pisa, **1844.**
**Camp'us Martius** (*măr'shŭs*), large field on Tiber R. near anc. Rome used for military drills and popular assemblies, **3056.**
**Cana** (*kā'nȧ*) **of Galilee,** a village in Palestine near Nazareth; scene of Christ's first miracle, **1888.**
**Canaan** (*kā'nän*), name applied to pre-Israelite Palestine, peopled by descendants of Canaan, son of Ham, **1890, 2643.**
**Ca'naanites, 1890;** David conquers, **967;** identified with Phoenicians, **2774.**
**Can'ada,** a Brit. dominion in N. Amer.; 3,730,000 sq. mi.; pop. 9,000,000; **600–10, 2514–7,** *maps,* **602–3, 616, 2514–5,** *Study Outline,* **3889;** canals, **627, 3130, 3716, 3108, 1705;** education, **622, 2947, 2948, 833** (*see also in Index* **Colleges and universities**); flag, **1287;** immigration, **601, 610, 617, 2137, 3639, 3128;** Indians, **1765–74,** legends, **611–5, 1586–8, 2360–2, 3727–9;** legal holidays, **1673;** national parks, **2400, 83;** national song, **2405;** population, **601, 610, 617, 1774, 2945, 2948,** *map,* **2514;** railroads, **601, 604, 606, 608, 2449, 2963;** religion, **622, 2945, 2947, 3128;** time zones, **3500.**
*Geography and industries:* agriculture, **606, 608, 610, 3730, 3732, 1292, 2986;** Arctic regions, **189;** extent and physical features, **601–4, 2514–5,** *map,* **2514;** climate, **606, 512–3, 2698–9, 2516–7;** dairying, **953, 2582;** fisheries, **610, 512, 1280;** furs and fur trade, **610, 1389, 1692, 3527–9;** geological history, **2516–7, 1970, 1720–1, 1465–6, 2790;** Hudson Bay, **1690;** irrigation, **1830, 512;** lumber and forestry, **610, 1327, 1331, 2082;** manufactures, **610;** minerals, **610, 225, 816, 2507, 2755, 3242, 3836;** mountains, **3036, 1970;** rainfall, *map,* **2514;** rivers and lakes, **601, 604, 1511–2, 2102, 2136, 2986, 2698–9, 3107–9, 3835;** vegetation, *map,* **2514;** water-power, **3694, 869, 2502, 2604.**
*Government.* **620–2;** agriculture promoted, **608;** cabinet system, **555;** forest service, **1331;** life-saving service, **1997;** marine fisheries, **1280;** Northwest territories, **2528, 2866;** post office, **2898;** public lands, **1960;** woman suffrage, **3779.**
*See also in Index* **Canadian history; Canadian literature;** and names of cities, provinces, and chief physical features.
**Canada, Lower.** *See in Index* **Quebec.**
**Canada, Upper.** *See in Index* **Ontario.**
**Canada balsam, 1248.**
**Canada goose, 1488.**
**Canada lynx, 2087.**
**Canada thistle, 3489, 3712.**

**Canadian history,** 616–22; chief events summarized, **1663;** *Study Outline,* **3975.**
*Exploration and French rule,* **616–7, 109–11;** Northmen discover N. Amer., **2526;** Cabot, **561–2;** Cartier, **651–2;** Champlain, **686–7;** Hudson Bay charted, **1690;** Montreal founded, **2317;** Hudson's Bay Company formed, **1692;** Frontenac, **1375;** Marquette and Joliet, **2151, 1900;** La Salle, **1964–5;** early fur trade, **1389, 1692, 1333;** conflict with Gt. Brit., **1362, 2538, 4, 3775.**
*Development of self-government* (1763–1867), **617–8;** Loyalist immigration, **617, 2449, 2538, 2583;** Mackenzie crosses Rockies, **2102;** Selkirk settlement, **3752;** War of 1812, **3670–3;** Great Lakes neutralized, **1514;** Rebellion of 1837, **618, 2673, 2947, 2102;** Maine boundary dispute, **3617, 2129;** union of Upper and Lower Canada, **2947;** responsible govt. established, **307;** Dominion govt. established (1867), **618, 2096, 3553.**
*Under Dominion government,* **618–20;** administrations of Sir John A. Macdonald, **618, 620, 2096;** Red River rebellion, **2137, 2986, 3369;** Brit. Columbia joins federation, **513;** Riel rebellion (1885), **3129;** Canadian Pacific Ry. built, **513, 3369, 2096, 2137;** Laurier's administration, **620, 1971;** in Boer War, **3369, 1693;** Yukon organized, **3836;** reciprocity with U.S. defeated, **620, 1971;** under Sir Robert Borden, **466–7;** in World War, **620, 466–7;** conscription, **1971, 2947;** Sir Sam Hughes, **1693;** Gen. Currie, **940–1;** woman suffrage, **3779;** in League of Nations, **467.**
**Canadian literature,** 623–5; Indian lore, myths retold, **611–5, 1586–8, 2360–2, 3727–9.**
**Canadian Northern Railway,** **608.**
**Canadian Pacific Railway,** **2963, 608, 2449;** influence, **2137;** origin, **513;** "Pacific scandal," **2096, 618;** Lord Strathcona, **3369.**
**Canadian porcupine,** **2883.**
**Canadian River,** in s.w. U.S., rises in n.e. N.M. and flows 900 mi. e. across Tex. and Okla. to Arkansas R., **3476.**
**Canadians,** in U.S., **3587.**
**Canadian sable,** **2156.**
**Canaigre** (*kȧ-nā'gēr*), a variety of dock; root used in tanning, **202.**
**Canal du Midi** (*kȧ-nȧl' dụ mē-dē'*), France, **1346, 625.**
**Canals,** 625–7; Babylonia and Assyria, **625, 1187;** Caledonian, **3146;** Canada, **627, 3108;** Cape Cod, **627, 640,** *map,* **2166;** Chesapeake and Ohio, **626;** Chicago Drainage, **627, 1733–4;** China, **625, 745, 749, 230;** Corinth, **886;** Delaware and Chesapeake, **987,** *map,* **988;** Egypt (anc.), **1102;** England, **625–6;** Erie, **627, 2484,** *picture,* **625;** Europe, **626, 1439, 3005, 3012, 961;** Florida, **1300,** *map,* **1298;** France, **1346, 1193;** Georgian Bay project, **1705;** Holland, **2438,** *picture,* **1191;** Illinois and Michigan, **1733;** Kiel, **626, 321, 1629;** Manchester Ship, **626, 1578–9, 2134;** New Orleans Inner Harbor, **2468;** New York State Barge, **2484–5;** Nicaragua project, **2505;** Ohio, **2568;** Panama, **2650–63;** Russia, **3085–6;** "Soo," **3129–30, 1513;** Suez, **3384,** *map,* **1095;** Trent, **627,** *picture,* **2583;** Venice, **3623,** *picture,* **3624;** Welland, **3716.**
**Canals of Mars,** **2816.**
**Canal Zone,** territory on both sides of Panama Canal leased by U.S., **2648–9, 2663, 1477,** *map,* **2662.**
**Canandaigua Lake.** Long, narrow lake of w. New York, 30 mi. s.e. of Rochester; length 15 mi.; picturesque scenery.
**Canary** (*kȧ-nā'rĭ*), a songbird of finch family, **627–8;** care, **2757.**
**Canary Islands,** group about 60 mi. off n.w. coast of Africa; 2835 sq. mi.; pop. 510,000; **628;** bananas, **324–6;** canaries, **627;** emigration to Uruguay, **3608.**
**Canber'ra,** cap. of Australia, **628.**
**Cancer** (*kăn'sẽr*), constellation, **3840,** *picture,* **873.**
**Cancer,** genus of crabs, **914.**
**Cancer,** malignant growth; effect of radium, **2960.**
**Cancer, Tropic of,** **1968–9;** winds, **3750,** *picture,* **3751.** So named because sun is in "Cancer" sign of zodiac when over the Tropic.
**Can'dia,** seaport, largest city, and former cap. of Crete, on n. shore; pop. 25,000; **918.** Also Italian name of Crete.
**'Candide'** (*kän-dēd'*), story by Voltaire ridiculing optimism, **3661.**
**Candle,** **1958, 1476;** source of heat, **1250;** as measure of time, **799.**
**Candleberry.** Same as **Bayberry.**
**Candle-fish** or **oo'lakan.** A very oily smelt-like fish of n.w. coast of America; used by Indians as candle by drawing through it the pith of a rush or a strip of bark as wick; also used as food.
**Can'dlemas.** Church festival, Feb. 2, in commemoration of presentation of Christ in Temple.
**Candle-nut,** **2546.**
**Candle pins,** a game, **475.**
**Candle-power.** Light given by a specified type of candle, used as unit of illuminating power.
**Candolle** (*kän-dōl'*), **Augustin de** (1778–1841). Swiss botanist; introduced natural as opposed to artificial or Linnaean system of classification.
**Can'dour, Mrs.** In Sheridan's 'School for Scandal', a slanderer who affects great frankness.
**Candy,** Ceylon. Same as **Kandy.**
**Candy,** **628–30;** chocolate bars, **756;** food value, **1321;** glucose in, **1475.**
**Can'dytuft.** A genus of herbs of the mustard family, several species of which, having heads of white flowers, are cultivated as garden plants.
**Canea** (*kä-nē'ä*), seaport and cap. (since 1841) of Crete, on n.w. shore; pop. 24,000; **918.**
**Canebrake,** thicket of canes, **1502.**
**Cane sugar,** **3385–8.**
**Canfield, Dorothy** (born 1879). Pen name of Dorothy Canfield Fisher, Amer. author, b. Lawrence, Kan. ('The Squirrel Cage'; 'The Brimming Cup'; 'Understood Betsy'; 'The Montessori Mother').
**Canidae** (*kăn'ĭ-dē*), the dog family, **1023, 3950.**
**Canine teeth,** **3452,** *pictures,* **3453.**
**Canis** (*kā'nĭs*), the dog genus; includes dogs, **1018–25;** jackals, **1855;** wolves, **3775.**
**Canisius College.** Cath. institution for men at Buffalo, N.Y.; founded 1870.
**Canis major** ("Great Dog"), a constellation, **872,** *charts,* **873, 3343.**
**Canis minor** ("Little Dog"), a constellation, *charts,* **873, 3343.**
**Can'ister shot,** **636.**
**Canker,** various plant diseases; in grapefruit, **1500.**
**Cankerworm,** caterpillar destructive to trees, **630.**
**Canna** (*kăn'ȧ*), plant, **630–1.**
**Can'nabis,** genus of hemp plants, **1630.**
**Cannae** (*kăn'nē*), anc. village near s.e. coast of Italy where Hannibal annihilated Rom. army (216 B.C.); battle, **1575, 651.**
**Canned heat,** **84.**
**Cannel coal** ("candle"), a bituminous, non-coking type, burning with a bright candle-like flame; splits into layers and burns well in open grates; in W.Va., **3722.**
**Cannes** (*kăn*), France, seaport and fashionable winter resort on Mediterranean; pop. 30,000; perfume-making, **2728.**
**Cannibal Islands.** *See in Index* **Fiji Islands.**
**Cannibalism,** among Aztecs, **290;** origin of, **2118;** in Pacific isls., **2618, 1239, 2451.**
**Canning, George** (1770–1827), brilliant Eng. statesman and orator; as foreign secretary, supported liberal tendencies; recognized independence of revolted Span. colonies in S. Amer.; and Monroe Doctrine, **2307.**
**Canning industry,** **631–3;** alum used in, **104;** in Calif., **3124,** *picture,* **579;** fish canning, **1286, 3114;** glucose, **1475;** why tin cans are used, **3504.**
**Cannon, Joseph G.** (born 1836). Amer. political leader, b. Guilford, N.C., Republican member of Congress from Illinois 1873–91, 1893–1913, 1915–23; speaker, 1903–11.
**Cannon,** **633–6;** first used, **633, 1552, 1700, 2979;** hand cannon, 14th cent., *picture,* **1253;** installed on submarines, **3376;** milling and boring, *picture,* **3516;** naval, **633, 2423,** *pictures,* **2426, 633, 2427;** in World War, **3791,** *pictures,* **3805, 633.**
**Cannon Ball River,** N.D., rises in s.w. and flows e. 150 mi. to Missouri R.; *map,* **2529.**
**Cannon-bone,** of horse, **1683.**
**Cano, Alonso** (1601–67). Span. architect, painter, and sculptor; chief architect of Granada cathedral; religious paintings characterized by bold design and pure flesh-tints; for variety of his talents dubbed "Spanish Michelangelo."
**Canoes and canoeing,** **441–2, 444, 446;** Pacific isl. canoes, *pictures,* **2618, 2620, 443.**
**Canoewood,** from tulip tree, **3548.**
**Canon,** inspired books of Bible, **390.**
**Cañon City,** Colo., health resort 41 mi. n.w. of Pueblo on Arkansas R.; pop. 4551; state penitentiary; **845.**
**Canonical hours,** **2299, 2300.**
**Canonization.** Declaration by the pope that a deceased person is a saint; preceded at long intervals by stages of "venerable servant of God" and "beatification"; 50 years must elapse between death and canonization.
**Canon law,** defined, **1972.**
**Canons,** clergy, **763.**
**Canonsburg,** Pa. Borough 16 mi. s.w. of Pittsburgh, in rich coal region; pop. 10,632; iron and pottery products; center of Whiskey Rebellion of 1794.
**Cano'pus,** a star, **3342,** *chart,* **3343.**
**Canossa** (*kä-nŏs'sä*), Italy, ruined castle 80 mi. e. of Genoa; here Ger. emperor Henry IV did penance before Pope Gregory VII (1077), **1632–3, 1541.**
**Canova** (*kä-nō'vä*), **Antonio** (1757–1822), Ital. sculptor; leader of classic revival, **3158;** statue of Perseus, *picture,* **3159.**
**Canovas del Castillo** (*kä-nō'väs dĕl käs-tēl'yō*), **Antonio** (1828–97). Span. statesman, several times Conservative premier of Spain, alternating in office with Sagasta; planned autonomy for Cuba; assassinated.
**Can'so, Strait of,** passage between Nova Scotia and Cape Breton Isl., *map,* **602–3.**
**Canta'brian Mts.,** range extending w. from Pyrenees across n. Spain over 300 mi., bordering Bay of Biscay; highest point 8743 ft.; *map,* **3300.**
**Canta'ta,** a musical composition, **2378.**
**Canteen',** refreshment booths or stations; Red Cross, **2984,** *picture,* **2985.** Name also given to soldier's metal water-flask.
**Can'telope,** **2195–6;** Alaska, *picture,* **76;** when and how to plant, **1397.**
**Can'terbury,** England, cathedral city 55 mi. from London; pop. 25,000; **636–7;** shrine of Thomas Becket, **358.**
**Canterbury bells,** species of bluebell, **439.**

**'Canterbury Tales'**, by Geoffrey Chaucer, **701–2, 1163, 1934**; stories from, **704–7.**
**Canthar'idin.** Blistering substance secreted by "Spanish fly" beetle.
**Cantigny** (*kän-tē-nyē'*). France, village 18 mi. s. of Amiens; first offensive action of Americans in World War, **638.**
**Cantilever bridge, 506,** *pictures,* **507, 509.**
**Canton, John** (1718–72), Eng. physicist, **1118.**
**Canton,** China, cap. of Kwangtung province and commercial center of s. China; pop. 1,250,000; **638–9, 746**; anc. water clock, **639,** *picture,* **798.**
**Canton,** Ill. Mfg. city 25 mi. s.w. of Peoria; pop. 10,928; agricultural implements, cigars; trade in coal and farm products.
**Canton,** Ohio, 55 mi. s.e. of Cleveland, city in farming and coal-mining district; pop. 87,091; sheet metal, pottery, steel products, iron bridges; home and burial place of Pres. McKinley; **2570.**
**Canton River,** also called **Shu-kiang** ("Pearl River"), main channel of the delta formed by the Si-kiang; at Canton, **638, 639**; Hongkong, **1678.**
**Cantons,** states of the Swiss confederation, **3416.**
**Canu'sium.** Important city of anc. Apulia, Italy, near Adriatic Sea; subject to Rome 318 B.C.; now town of 18,000, Canosa; 12th cent. cathedral with tomb of Bohemond; battlefield of Cannae near by.
**Canute** (*kà-nụt'*) (994–1035), great king of Danes and Norwegians, ruler of England 1017–35, **639, 1152**; friend of Christianity, **997.**
**Canvas,** a square-meshed, heavy cloth, often waterproof; used for sails, embroidery, painting; canoes, **442**; tents, **595–6.**
**Canvasback,** a sea-duck, **1045, 2160, 716**; *picture,* **1046.**
**Canyon** (*kăn'yŏn*), deep river channels with precipitous sides, **639, 2791, 3615**; characteristic of Ariz., **200,** Colo., **844**; Devil's Canyon, Ariz., *picture,* **2966**; Grand Canyon, **1495–7,** *pictures,* **1496, 2402,** model, *picture,* **1495**; Rio Grande, **3022**; Yellowstone, **3830.**
**Canyon City,** Tex.; pop. 1618; **3478.**
**Caoutchouc** (*kụ'chụk*). Same as **Rubber.**
**Cap,** size of paper, **2673.**
**Cape,** a point of land extending into sea or lake; origin, **2788.** For individual capes *see* under proper names, as **Blanco, Cape,** except as below.
**Cape Ann,** promontory of n.e. Massachusetts, **2166.**
**Cape Breton Island,** Canada, separated from Nova Scotia by Strait of Canso; 3120 sq. mi.; pop. 100,000; **639–40,** *map,* **602–3**; cable, **560**; coal, **2538**; discovered, **561**; Louisburg fortress, **2538.**
**Cape Cod,** Mass., L-shaped peninsula between Nantucket Sound and Cape Cod Bay; length, 65 mi., width 1 to 10 mi.; **640, 2169–70**; dunes controlled, **3122**; oyster gathering, *picture,* **2613**; Pilgrims, **2164, 2176.**
**Cape Cod Canal,** across neck of peninsula joining Cape Cod Bay to Buzzards Bay, **640, 627, 2169–70.**
**Cape Colony.** *See in Index* **Cape of Good Hope.**
**Cape Fear River,** N.C., rises in n.-cent. part and flows 300 mi. s.e. to Atlantic, **2518, 2520.**
**Cape Girardeau',** Mo., city on Mississippi R., in s.; pop. 10,252; makes shoes, cement, various wood products; trade in lumber, flour, limestone; river, **2266.**
**Cape leather and gloves, 1475.**
**Capel'la,** a fixed star, **3342**; *chart,* **873, 3343.**
**Cape May,** southernmost point of New Jersey, *map,* **2458**; origin, **2788.**
**Cape May,** N.J., resort at extreme s. end of state; pop. 2999; **2458,** *picture,* **2461.**
**Cape of Good Hope,** promontory near southern tip of Africa, **640**; route to India, **3279**; rounded by Da Gama, **1393.**
**Cape of Good Hope,** formerly Cape Colony, a province of British S. Africa; 276,966 sq. mi.; pop. 2,565,000; **3280, 3282, 3283**; cap. Cape Town, **640–1**; ostriches, **2603**; Cecil Rhodes, **3011.**
**Capernaum** (*kà-pēr'nà-ŭm*). Anc. town of uncertain location; perhaps on n. coast of Sea of Galilee; often visited by Jesus.
**Ca'pers,** a condiment, **3318.**
**Capet** (*kă-pā'*), **House of,** reigning family of France from 987 to 1328, **1352, 1636, 2064–5, 2762–3**; line ends with Charles IV, **2763**; France unified, **1195.**
**Capet, Hugh** (939?–996), king of France, elected by nobles and prelates to succeed Louis V, last of the Carolingians; founds Capetian dynasty, **1352.**
**Cape-to-Cairo Railroad, 3283, 2963, 41**; route, *maps,* **1095, 3282**; Cairo, **567**; planned by Rhodes, **3011**; at Victoria Falls, **3641.**
**Cape Town,** cap. of Cape of Good Hope province; largest city in S. Africa; pop. 200,000; **640–1, 3283,** *pictures,* **39, 3279.**
**Cape Verde** (*vērd*) **Islands,** Port. colony in Atlantic 320 mi. w. of Cape Verde, Africa; 1480 sq. mi.; pop. 150,000; **641**; Portugal colonizes, **2888, 1638.**
**Cap'illary,** minute blood vessel, **438,** *pictures,* **2373.**
**Capillary attraction,** in liquids, **641.**
**Capital,** in architecture, **177,** *picture,* **180.**
**Capital,** in economics, **1077**; Marxian doctrine, **3268**; obtained by sale of securities, **3358**; origin of word, **663.**
**'Capital',** by Karl Marx, **2157.**
**Capital punishment, 2919.**
**Capitol,** Rome, **3049–50, 2248**; Washington, D.C., **3680, 3682,** *picture,* **3681.**
**Capitoline** (*kăp'ĭ-tō-līn*) **Hill,** smallest but most famous of 7 hills of Rome, **3056**; statue of Jupiter, **1903.**
**Capitula'tions,** treaties with Turkey, **3559.**
**Ca'pon Springs,** W.Va., **3720.**
**Caporet'to, battle of, 3797.**
**Cappadocia** (*kăp-à-dō'shĭ-à*). Anc. inland country in Asia Minor w. of Euphrates R.; conquered by Persians and by Alexander the Great; reduced to Rom. province by Tiberius 17 A.D.
**Cap'pel, battle of, 3842.**
**Capra** (*kä'prà*), the goat genus, **1476, 1719.**
**Caprera** (*kà-prā'rà*), Ital. isl.; Garibaldi's home, **3127.**
**Capri** (*kä'prē*), beautiful isl. s. of Bay of Naples, Italy; 5½ sq. mi.; resort of tourists and artists; **2390.**
**Cap'ricorn, Tropic of, 1968–9**; winds, **3750.** So named because sun is in "Capricorn" sign of zodiac when over the Tropic.
**Capricor'nus,** "the Goat" in zodiac, **3840.**
**Caprifica'tion** of figs, **1237,** *picture,* **1238.**
**Capri fig, 1237.**
**Caprifolia'ceae,** the honeysuckle family, **3943.**
**Caprimulgidae** (*kăp-rĭ-mŭl'ġĭ-dē*), the goatsucker family of birds, **2508, 3733.**
**Caprivi** (*kä-prē'vē*), **Georg Leo von, Count** (1831–99). Ger. soldier and statesman; imperial chancellor 1891–94.
**Cap'sicum,** a genus of peppers, **2723, 3318.**
**Captain,** in army, rank appropriate to commander of company or equal unit, **218**; U.S. Army insignia, **3576.**
**Captain,** in navy, rank appropriate to commander of a capital ship, **2426**; corresponds to colonel of army; U.S. Navy insignia, **3577.**
**'Captains Courageous',** novel by Kipling, **1927.**
**Capua** (*kăp'yụ-à*), Italy, town 17 mi. n. of Naples, on site of anc. Casilinum; pop. 13,500; anc. Capua, 3 mi. distant, was luxurious city under Romans; **3310.**
**Capuchin** (*kăp'yụ-chĭn*) **monkey, 2290,** *picture,* **2289.**
**Capuchins.** Branch of the Franciscan friars; extreme vows of poverty, and much attention to learning.
**Capulet,** noble family of Verona; feud with the Montagues forms basis for tragedy of Shakespeare's 'Romeo and Juliet', **3058.**
**Capybara** (*kä-pē-bä'rà*), the largest rodent, **3036.**
**Carabao** (*kä-rà-bä'ō*), water-buffalo of Philippines, **527, 2768,** *picture,* **2765.**
**Carabobo** (*kä-rä-bō'bō*), Venezuela. Plain 20 mi. s.w. of Valencia; victory of Bolivar over Spaniards 1821 established Colombian independence.
**Caracal** (*kăr'ă-kăl*), a species of lynx, *picture,* **2087.**
**Caracalla** (*kăr-à-kăl'à*), nickname of Bassianus (186–217 A.D.), Rom. emperor; succeeded 211; brutal madman; baths, **3052, 3058,** *picture,* **3057.**
**Carácas** (*kä-rä'käs*), Venezuela, cap., 6 mi. from seaport, La Guaira, on Caribbean Sea; pop. 90,000; **3621, 448, 3285,** *pictures,* **3621–3, 3287.**
**Caracci.** *See* **Carracci.**
**Cara'tacus.** King of Britain; opposed Romans; defeated 51 A.D. after 8 years' war, imprisoned at Rome; Tacitus ('Annals', Bk. XII, chap. 37) quotes noble speech he made before Rom. emperor.
**Car'acul.** Same as **Karakul.**
**Carageen.** Same as **Carrageen.**
**Car'amel,** made from sugar, **3389**; candy, **630.**
**Car'apace,** or shell; of crustacea, **3202**; of turtle, **3562.**
**Car'at,** unit of weight for gems, about 3.2 grains; also measure of purity of gold, **1481.**
**Caravaggio** (*kä-rä-vä'ġō*), **Michelangelo Merisi da** (1569–1609). Ital. painter of religious and genre subjects, founder of the naturalistic school.
**Caravans,** Arabia, **228–9**; Khyber Pass, **31**; Sahara, **3105–6,** *pictures,* **233, 3106.**
**Car'avel,** a vessel, **3208**; Columbus' *Santa Maria,* **3207.**
**Car'away,** herb of the parsley family, **3317, 3318,** *picture,* **3319.**
**Carba'jal, Francisco de** (1464–1548). Span. soldier; with Cortez in Mexico and Pizarro in Peru; his extraordinary valor gave him nickname "Demon of the Andes."
**Carberry Hill,** 7 mi. s.e. of Edinburgh; Mary Queen of Scots taken prisoner (1567), **2158.**
**Carbide,** compound of carbon and metallic element; of calcium, **571, 8, 1383, 2512.**
**Carbohy'drates,** compounds containing hydrogen and oxygen (in proportions of two to one) with carbon, **1710, 4044, 642**; in food, **1320.**
**Carbolic acid,** or phenol, **641–2**; antidote, **1270, 2854**; antiseptic properties, **151**; base of plastic materials, **673**; distilled from coal-tar, **814.**
**Carbon,** a chemical element, **642, 4042, 4043**; amorphous and crystalline forms, **935**; forms charcoal, **688**; coal, **812**; diamonds, **1002, 935**; graphite, **1502, 935**; in plant life, **2824**; in protolasm, **2926, 394**; proportions in iron and steel, **1824**; in smoke, **3253**; used in electric

light filaments, **1123**, in ink, **1780**. —*Compounds:* carbides, **571, 8, 1383, 2512**; disulphide, **3390, 673**; hydrocarbons, **642, 384, 1225–7, 2750, 1406**; oxides, **642, 1232, 10, 1406**. *See also in Index* **Carbohydrates; Carbonates; Carbon dioxide.**

**Carbonari** (*kär-bō-nä'rē*) ("charcoal burners"), **1837**; and Mazzini, **2178**.

**Carbonated water,** how made, **642**.

**Carbonates,** of ammonia, **118**; calcium (chalk and limestone), **685, 2010, 3201**; lead (white lead), **1973, 2642**; sodium (soda), **3271, 3272**.

**Carbondale,** Ill., city 95 mi. s.e. of St. Louis; pop. 6267; normal school, **1736**.

**Carbondale,** Pa. City 15 mi. n.e. of Scranton; pop. 18,640; anthracite coal region; makes perforated metals, screens, machinery.

**Carbon diox'ide, 642**; in air, **50, 52**; makes bread rise, **3828, 305**; and calcium hydroxide, **571**; fire extinguisher, **1262**; generated by bacteria, **303**, by baking powder, **10**, by combustion, **2611**, by volcanoes, **3657**, by yeasts, **3828, 1232**; in human blood, **1616**; Ice Age, **1721**; in illuminating gas, **1406**; lime water test, **2010**; as plant food, **2824, 1980, 2797, 2998**; in refrigerating systems, **2990**; respiration, **2792**; in smoke, **3253**; in soda water, **3272**; in Solvay process, **3272**.

**Carbonic acid, 642**; dissolves limestone, **571**.

**Carbonif'erous period,** or "Coal Age," **1418,** *picture*, **1419**; character of vegetation, **3533,** *picture*, **136**; giant ferns, **1232**; giant insects, **1788**; in N. Amer., **2516**; petroleum formation, **2752**; primitive fish, **1277**; reptiles, **1418**, roaches, **817**.

**Carbon monox'ide,** poisonous gas, **642**; from gas heaters, **1624**; in illuminating gas, **1406, 1407**; poisonous effect, **2855**.

**Carborun'dum,** hard artificial compound, **3234, 1383**; as radio detector, **3761**.

**Car'buncle.** Acute inflammation of tissue beneath the skin; resembles boil in early stages, but much more painful and often accompanied by constitutional disturbances such as chills or fever.

**Carbuncle.** A garnet cut with a convex surface and flat or concave below in order to lighten the color; name applied by ancients to all red and fiery stones, including ruby.

**Carbureter** (*kär'bū-rĕt-ĕr*), in gas engine, **282, 1404**.

**Carcassonne** (*kär-kä-sōn'*), France, town on Aude R. 53 mi. s.e. of Toulouse; pop. 30,000; wine market; medieval fortress, wall attributed to Visigoths; **1350**.

**Carchemish** (*kär'kē-mish*). Ancient Hittite cap. on upper Euphrates R.

**Car'damom,** a spice, **3317**.

**Cardboard,** how made, **2673**.

**Cardenas** (*kär-dā'näs*), Cuba. Seaport on n.w. coast; pop. 33,000; exports sugar, tobacco; engagement between Amer. vessels and Span. batteries in 1898.

**Car'diac orifice** of stomach, **3360**.

**Car'diff,** Wales, coal and iron shipping port on Taff R. just above Bristol Channel; pop. 190,000; 11th cent. castle; University College of S. Wales; **3664, 1160**.

**Cardigan, James Thomas Brudenell, Earl of** (1797–1868). Commander in "charge of the Light Brigade" at Balaklava 1854, celebrated in Tennyson's poem.

**Cardigan Bay,** Wales, **3664,** *map*, **1159**.

**Cardinal bird** or cardinal grosbeak, **642–3, 1241**.

**Cardinal flower, 643**.

**Cardinal points** of compass, **643, 854**.

**Cardinals, College of,** in Rom. Cath. church (advisory body to pope; 70 in number, appointed by pope and hold office for life), **643, 763, 2666**.

**Carding,** cotton, **902–4**; wool, **3787,** *picture*, **3784**.

**Cards, playing, 643–4**

**Card sliver,** *picture*, **903**.

**Carducci** (*kär-dų'chē*), **Giosuè** (1836–1907), Ital. poet, greatest of later 19th cent. and liberator of Ital. poetry from hitherto fashionable sentimental romanticism; chief works, **1833**.

**Carey, George Sandeman** (born 1867), Brit. general; at defense of Amiens, **3275**.

**Carey, Henry Charles** (1793–1879). Amer. economist, fervent and original in argument; staunch advocate of protective tariff.

**Carey, William** (1761–1834). Eng. oriental scholar and first Bapt. missionary to India; leader in 19th cent. Protestant missionary movement; translated Bible into many oriental languages.

**Caria** (*kā'ri-ȧ*), anc. country in s.w. corner of Asia Minor; contained Gk. towns of Miletus and Halicarnassus; *map*, **1518**.

**Car'ib,** warlike stock of S. Amer. Indians; word cannibal derived from their name (Caribal); **644, 1676, 3622**.

**Caribbe'an Hills, 3621**.

**Caribbean Sea,** arm of Atlantic, 750,000 sq. mi., inclosed by e. coast of Cent. Amer., n. coast of S. Amer., and crescent of W. Indies, **644, 3718,** *map*, **2514–5**; hurricanes, **1545**; "Spanish Main," **835**; U.S. interest in, **2663**.

**Caribou** (*kăr'i-bo͞*), wild reindeer of N. Amer., **644, 980**; ancestors of domesticated reindeer, **2993**; antlers, **979**; Hudson Bay herds, **603**.

**Caribou** or **Reindeer Mts.** Range in n. Alberta n. of Peace R.

**Carillon** (*kăr'i-lȯn*) or **glockenspiel** (*glŏk'ĕn-spēl*), set of bells or metal bars arranged so that tunes may be played upon them, **378, 2591**.

**Carin'thia,** Austria, mining (especially lead) and mfg. province in extreme s.; 3678 sq. mi.; pop. 370,000; pine forests; chief city Klagenfurt; **269**.

**Carleton** (*kärl'tŏn*), **Sir Guy, Baron Dorchester** (1724–1808). Brit. general and statesman, gov.-gen. and commander of Brit. forces in Canada at outbreak of Amer. Rev.; commander-in-chief of Brit. forces in N. Amer. 1782–83; gov. of Quebec (then including Canada to Mississippi R.) 1786–96. His repulse of Arnold's attack on Canada (1776) probably saved Brit. N. Amer. to Gt. Brit.

**Carleton, Will** (1845–1912). Amer. poet of homely themes, b. Hudson, Mich. ('Farm Ballads'; 'Farm Legends'; 'City Ballads'; 'Poems for Young Americans').

**Carleton College.** At Northfield, Minn.; co-ed.; opened 1870 (chartered 1866); founded by Congregationalists, now non-sectarian; arts and sciences; music.

**Car'line thistle,** grows in poor soils of Europe; seeds, *picture*, **3172**.

**Carlisle** (*kär-līl'*), England, city in n.w. on Eden R. near Scotch border; pop. 58,000; cotton, woolen, iron mfrs.; castle where Mary Queen of Scots was imprisoned; Rom. wall, **1160**.

**Carlisle,** Pa., trade center 18 mi. s.w. of Harrisburg, near Mt. Holly Springs, mountain resort; pop. 10,916; headquarters of Washington during Whiskey Rebellion of 1794; Dickinson College; U.S. Indian Training School, **1774**.

**Car'los.** *See also in Index* **Charles.**

**Carlos I** (1863–1908). King of Portugal; succeeded 1889; suspended constitution 1907, assassinated while driving in Lisbon.

**Carlos, Don** (1545–68). Son of Philip II of Spain; vicious weakling about whose disappointment in love (his father married Carlos' fiancée, Elizabeth of Francc) and mysterious death Schiller and others have woven romances.

**Carlos, Don** (1788–1855). Uncle of Isabella II of Spain and first Carlist pretender to Span. throne; called Charles V by followers.

**Carlot'ta** (born 1840). Empress of Mexico, wife of Maximilian and daughter of Leopold I of Belgium, became insane after execution of husband, and lived in retirement near Brussels.

**Carls'bad,** N.M., trade city in s.e. on Pecos R.; pop. 2205; mineral springs; irrigation project, **2465**.

**Carls'ruhe.** Same as **Karlsruhe.**

**Carlyle** (*kär-līl'*), **Jane Welsh** (1801–66), witty, brilliant, sharp-tempered, but devoted wife of Thomas Carlyle, **645**; quoted, **2153**.

**Carlyle, Thomas** (1795–1881), Scotch essayist and historian, **645–5**; friendship with Emerson, **1141–2**; place in Eng. literature, **1167, 1178**; poem quoted, **3503**; quoted on history, **1654**.

**Carman, Albert** (born 1833). Canadian clergyman and educator, first chancellor of Albert Univ.; first general superintendent Meth. church in Canada.

**Carman, Bliss** (born 1861), Canadian poet and essayist, **624**.

**Carmar'then,** Wales. Old seaport town in s. on Towy R.; pop. 10,000; cap. of Carmarthenshire (918 sq. mi.).

**Carmarthen Bay,** Wales, **3664**.

**Car'mel, Mt.** Ridge in cent. Palestine near Mediterranean, associated with Elijah and Elisha; Carmelite order founded there by hermits.

**Car'melite Friars,** mendicant order of "Our Lady of Mount Carmel" founded 1207; called White Friars in England because of white mantle; **2300**; associated order of nuns, **2302**.

**Car'men,** fickle fascinating gipsy heroine of Mérimée's story; Bizet's opera 'Carmen', founded thereon, **2584, 3181**.

**Carmen Sylva** (1843–1916), pen name of Elizabeth, queen of Charles, first king of Rumania, **3082**.

**Carnar'von Bay,** Wales, **3664**.

**Carnarvonshire,** Wales, mountainous county in n.w.; 565 sq. mi.; pop. 117,000; county seat Carnarvon (pop. 10,000); castle, *pictures*, **3665, 656**; returns Lloyd George to Parliament, **2039**.

**Carnat'ic** or **Karnatak,** region in Madras presidency extending along e. coast of s. India, **1746, 1753**.

**Carnation,** cultivated variety of pink, **645, 2809, 1396**.

**Carneau** (*kär-nō'*) **pigeon,** *picture*, **2805**.

**Carnegie** (*kär-nĕg'i*), **Andrew** (1835–1919), Scotch-Amer. ironmaster and philanthropist, **645–6**; Hague Tribunal, *picture*, **1558**.

**Carnegie,** Pa. Borough 5 mi. s.w. of Pittsburgh with extensive steel works; center of coal-mining region; pop. 11,516.

**Carnegie Foundation for Advancement of Teaching, 1086**.

**Carnegie Institution, 1086**.

**Carnegie Steel Company, 1826**.

**Carne'lian,** or red chalcedony, semiprecious form of quartz, **2945, 3233**; birthday stone, **1409**.

**Carniola** (*kär-ni-ō'lä*), former province in s.w. Austria-Hungary; 3856 sq. mi.; following World War included in Jugo-Slavia, except small strip to Italy; **1901**.

**Carnival,** festival just before Lent, **1070**; Mardi Gras in New Orleans, **2470,** *picture*, **2071**.

**Carnivora** (*kär-nĭv'ō-rà*), the order of flesh-eating mammals, **2132,** *Study Outline,* **3950–1;** evolutionary position, **128.**
**Carnivorous plants, 2829;** pitcher plant, **2811;** sundew, **3396;** Venus's Fly Trap, **3626.**
**Carnot** (*kär-nō'*), **Lazare Nicolas Marguerite** (1753–1823), Fr. statesman, general, mathematician, and military author, member of Committee of Public Safety and of Directory, **1370.**
**Carnot, Marie François Sadi** (1837–94). Fourth president of France (1887–94); assassinated, by anarchist; grandson of L. N. M. Carnot.
**Carnot, Sadi Nicolas Lionhard** (1796–1832). Fr. physicist, formulator of "Carnot's principle," or the second law of thermodynamics; son of L. N. M. Carnot.
**Car'notite,** a radium-bearing ore, **2960, 841.**
**Car'ob tree, 2045, 1603.**
**Carolina, province of, 2521, 3292.**
**Car'olina jasmine, 1876.**
**'Caroline'.** U.S. vessel, destruction of which by Canadians during rebellion in Upper Canada (1837) threatened to bring on war between Gt. Brit. and U.S.
**Caroline Islands,** scattered coral group in Pacific e. of Philippines; includes Ponape (pop. 2000), Yap (7150); formerly Ger.; Jap. mandate (1919); **2620, 2624;** shells, **3202.**
**Caroline of Anspach** (1683–1737), queen of George II of England, **1428.**
**Caroline of Brunswick** (1768–1821). Queen of George IV of England, who hated her, tried to divorce her, and excluded her from coronation ceremony.
**Carolin'gians,** Frankish rulers 751–987, descendants of Charles Martel, **1352.**
**Carols, Christmas, 758, 759.**
**Carolus Duran** (*kà-rō-lụs' dü-rän'*). **A. E.** (Charles Auguste Emile Durand) (1837–1917). Fr. portrait painter and teacher of painting.
**Carom** (*kăr'ŏm*), in billiards, **392.**
**Caroni** (*kä-rō-nē'*) **River.** A tributary of the Orinoco in Venezuela; flows n. 400 mi.
**Carot'id artery.** One of the two great arterial trunks of the neck (left and right sides) that convey blood to the brain.
**Carp,** a fish, **1278, 1483;** duration of life, *picture,* **126.**
**Carpaccio** (*kär-pät'chō*), **Vittorio** (d. 1522?). Venetian painter, among greatest of early Renaissance ('Life of St. Ursula' series).
**Carpal bones** of wrist, **1571.**
**Carpathian Mts.,** in cent. Europe, **646–7, 1190,** *map,* **271;** resources, **3081, 3115;** in World War, **3794.**
**Carpel.** The innermost structure of the flower, which contains the ovules.
**Carpenter bee, 362–3, 1786.**
**Carpenter's Hall,** Philadelphia, **2761.**
**Carpenter wasps, 3692.**
**Carpet.** *See in Index* **Rugs and carpets.**
**Carpetbaggers,** Northern politicians who settled in the South after Civil War, **780.**
**"Carpetbag" rule, 2072, 1611.**
**Carpet-beetle, 370.**
**Carracci** (*kär-rät'chē*), **Annibale** (1560–1609). Ital. painter, greatest of the three Carracci.
**Carracci, Ludovico** (1555–1619). Founder of the Bolognese or eclectic school of painting, teacher of Domenichine and Guido Reni, and uncle of the painters Annibale and Agostino Carracci.
**Carrageen** (*kăr-ă-gēn'*), or Irish moss, **3171, 1409, 2340,** *picture,* **3170.**
**Carranza** (*kä-rän'zä*), **Venustia'no** (1859–1920), president of Mexico (1917–20), **2217–8.**
**Carrara** (*kär-rä'rä*), Italy, city 60 mi. n.w. of Florence; pop. 49,500; famous marble quarries, **1844, 2144,** *picture,* **1839.**
**Carrel** (*kä-rĕl'*), **Alexis** (born 1873). Amer. surgeon and biologist, b. France; 1912 Nobel prize winner for success in suturing blood-vessels and transplanting human organs.
**Carreño** (*kär-rā'nyō*), **Teresa** (1853–1917). Venezuelan pianist, ranked among greatest of pianists, and called, because of the brilliancy and dash of her playing, "Valkyr of the piano."
**Carrick,** Pa. Residential borough 3 mi. s. of Pittsburgh; pop. 10,504.
**Carrickfer'gus.** Historic Irish seaport in Ulster 9 mi. n.e. of Belfast; pop. 9000; 12th cent. castle.
**Carrier, common, 2932, 3526, 1794.**
**Carrier pigeons, 2804, 130;** story, 'The Pigeon that Won a War Medal', **2806.**
**Carrier snail,** *picture,* **3256.**
**Carroll** (*kăr'ŏl*), **Charles, of Carrollton** (1737–1832). Amer. patriot, b. Annapolis, Md.; member of Continental Congress and last surviving signer of Declaration of Independence.
**Carroll, Lewis** (1832–98), pen name of Charles L. Dodgson, Eng. mathematician and story-writer for children, **647;** story of 'Alice in Wonderland', **647–50.**
**Carroll College.** At Waukesha, Wis.; founded 1846 as a high school, reorganized as college 1903; co-ed.; academic, collegiate, musical departments.
**Carrots** (*kăr'ŭts*), **650, 671;** when and how to plant, **1397;** wild, **3712.**
**Carson, Edward, Baron** (born 1854). Irish Unionist leader; head of Ulster rebellion against Brit. government's Home Rule Bill for Ireland 1912–13; Brit. atty.-gen., June–Oct., 1915, in Asquith coalition cabinet; First Lord of the Admiralty 1916–17; member War Cabinet 1917–18; opposed movement for Irish Republic.
**Carson, "Kit"** (1809–68), famous Amer. guide and trapper, **650, 581, 844.**
**Carson City,** Nev., cap. and summer resort near Calif. border at base of Sierra Nevada and 5 mi. from L. Tahoe; pop. 1685; **2445, 650.**
**Carson Lake,** small body of water in s.w. Nevada with no outlet; receives main stream of Carson R.; *map,* **2445.**
**Cartage'na,** Colombia, seaport on Caribbean Sea; pop. 52,000; exports cattle, hides, woods, tobacco; founded 1533; **835, 448.**
**Cartagena,** Spain, seaport, mfg. city, and mining center in s.e. on Mediterranean; pop. 103,000; naval station; founded 3d cent. B.C. by Carthaginians; **3300;** Blake destroys royalist fleet, **435.**
**Carteret** (*kär'tĕr-ĕt*), **Sir George** (1610?–80), Eng. royalist; lieut.-gov. of Jersey, Channel Isls., (1643–51); **2461.**
**Carteret, Philip** (d. 1796), Eng. rear-admiral and explorer, **2623.**
**Cartesianism,** the philosophy of Descartes, **2773, 3661.**
**Carthage** (*kär'thāj*), anc. city and state in n. Africa, **650–1, 3549;** founded by Phoenicians, **2774;** allied with Etruscans, **1186;** conquers Sardinia, **3126;** colonizes Spain, **3303;** Punic Wars, **3045–6, 1575–6;** Vandal capital, **3617–8.**
**Carthage,** Mo. Center of dairy-farming, zinc and lead-mining, and quarrying region, in s.w. on Spring R.; pop. 10,068; shoe mfrs.; destroyed during Civil War and entirely rebuilt.
**Carthage College.** A Lutheran co-ed. institution at Carthage, Ill.; founded 1870; classical, scientific, literary courses, Bible training, fine arts.
**Carthu'sian Monks, 2299,** *picture,* **2300.**
**Cartier** (*kär-tyā'*), **Sir George Etienne** (1814–73). Fr.-Canadian statesman, premier 1858–62; active in promoting Canadian federation, securing surrender of claim of Hudson's Bay Company in the Northwest, abolition of seigniorial land tenure in Lower Canada, and railway construction.
**Cartier, Jacques** (1491–1557), Fr. explorer of St. Lawrence R., **651–2, 2949, 3108, 515, 109,** *map,* **110.**
**Cartilage,** or gristle, a tough elastic animal tissue, **3245;** changed into bone, **452;** cricoid, *picture,* **2083;** thyroid, **3656–7,** *picture,* **2083.**
**Cartridges, 1254, 1256,** *picture,* **1255;** made in Conn., **510.**
**Cartwright, Edmund** (1743–1823), inventor of power-loom, **652.**
**Caruso** (*kä-rụ'sō*), **Enrico** (1873–1921). Ital. dramatic tenor, greatest of his time; gifted with extraordinarily powerful and beautiful voice.
**Carver, John** (1575?–1621), one of the Pilgrim Fathers; founder and first gov. of Plymouth Colony in Amer.; **2841.**
**Carving.** *See in Index* **Sculpture.**
**Cary, Alice** (1820–71) and **Phoebe** (1824–71). Amer. authors; sisters, b. near Cincinnati. Phoebe was author of 'One Sweetly Solemn Thought'.
**Caryatids, Porch of the,** *picture,* **250.**
**Casabianca** (*kä-zä-bē-än'kä*), **Louis** (1755–98). Fr. naval officer, commander of Napoleon's flagship which caught fire at Aboukir; his 10-year old son (subject of Mrs. Hemans' poem) refused to leave his father; both perished with the blowing up of the ship.
**Casablanca** (*kä-sä-blän'kä*) or **Dar-el-Beida.** Largest seaport of Morocco, on Atlantic coast; pop. 90,000; exports wool, leather, grain; occupied by French (1907).
**Casa Grande** (*kä'sà grän'dā*) **Park,** Ariz., **2400.**
**Casanova** (*kä-sä-nō'vä*) **Giovanni Jacopo** (1725–98). Venetian adventurer and writer; famous for 'Memoirs' of his amazing and eventful life which led him to all the capitals of Europe.
**Casas** (*kä'säs*), **Bartolomé de las.** *See in Index* **Las Casas.**
**Cascade** (*kăs-kād'*) **Mts.,** range in U.S. and Canada extending from n. Calif. to Brit. Columbia; highest peak Mt. Rainier (14,408 ft.); **3580, 2594, 3686.**
**Casca'ra,** source of, **330.**
**Case,** in grammar, **2537, 2921–2.**
**Case,** printer's, **3572.**
**Casein** (*kā'sē-ĭn*), protein compound found in milk, **2239, 1011, 2642, 2673.**
**Case'ment, Sir Roger** (1864–1916), Sinn Fein leader; knighted (1912) for investigations of Putumayo rubber atrocities; degraded from rank and executed (Aug. 3, 1916) for anti-British activities in Germany and his part in organizing the "Easter Rebellion" in Ireland; **1043, 1811.**
**Case School of Applied Science.** At Cleveland, Ohio; men; incorporated 1880 (opened 1881); civil, mechanical, electrical, and mining engineering, physics, chemistry.
**Cash,** a former Chinese coin, worth one-fifth of a cent; *picture,* **2283.**
**Cashew' apple, 1378.**
**Cashew nuts, 2546.**
**Cashgar.** Same as **Kashgar.**
**Cashmere** (*kăsh-mēr'*) or **Kashmir,** mountainous state in n. India; 85,000 sq. mi.; pop. 3,000,000, **652–3, 1744,** *map,* **1745.**
**Cashmere goat, 1477.**
**Cashmere rugs, 3077, 653.**

**Cashmere shawls,** 1477, 653.
**Cash register,** 653, 970.
**Casia'no oil field,** 2211, 2212.
**Casilinum** (*kăs-ĭ-lī'nŭm*). *See in Index* **Capua.**
**Casimir-Périer** (*kä-zē-mēr'-pā-ryā'*), **J. P. P.** (1847–1907). Fifth president of France (June 1894–Jan. 1895); resigned because of factional bickering and limitations on presidential power.
**Casino** (*kä-sē'nō*), at Monte Carlo, 2312–3.
**Casket Letters,** 2158.
**Caslon, William** (1692–1766). First of a famous family of Eng. typefounders; name is given to typefaces still much used.
**Casper,** Wyo., town on Platte R. on site of old Ft. Casper; pop. 11,447; 3822.
**Cas'pian Sea,** salt sea on borders of Europe and Asia; 700 mi. long, 130 to 270 mi. wide; **653–4, 1188, 3086,** *map,* **1196–7.**
**Cass, Lewis** (1782–1866), Amer. statesman, b. Exeter, N.H.; gov. of Michigan territory 1813–31; sec. of war 1831–36; sec. of state 1857; candidate for president, 3444.
**Cassaba** (*kăs-sä'bà*) **melon,** 2196.
**Cassandra** (*kă-săn'drà*). Daughter of Priam, king of Troy; prophetess of woe, doomed never to be believed; in vain warned against keeping Helen and admitting the wooden horse; became Agamemnon's captive; slain with him by Clytemnestra.
**Cassano** (*käs-sä'nō*), Italy. Town 16 mi. e. of Milan; French defeated Imperialists 1705; Russians and Austrians defeated French 1799.
**Cas'sareep,** a condiment, 3434.
**Cassatt', Mary** (1855–1916). Amer. artist, b. Pittsburgh, Pa.; strong vigorous impressionist (chiefly "mother and child" subjects).
**Cassava** (*kă-sä'và*), or manioc, 3434.
**Cassegrain'ian telescope,** 3462.
**Cassel** (*käs'ĕl*) or **Kassel,** Germany. Mfg. city on Fulda R. 90 mi. n.e. of Frankfurt; pop. 163,000; fine collection of paintings.
**Cassia** (*kăsh'à*) **bark,** 3317, 3318.
**Cassian** (*kăsh'ăn*) **Way.** Anc. military road from Rome to Arretium, Florence, and Lucca.
**Cassiopeia** (*kăs-ĭ-ō-pē'yà*), in Gk. myth., Ethiopian queen, mother of Andromeda, 2732.
**Cassiopeia,** constellation, *charts,* 873, 3343.
**Cassius Longinus** (*kăsh'ŭs lŏn-ġī'nŭs*), **Caius** (d. 42 B.C.). Rom. general, one of Caesar's murderers; called by Shakespeare "lean and hungry Cassius."
**Cassivellau'nus.** Brit. king, conquered by Julius Caesar (54 B.C.).
**Cas'sowary,** large ostrich-like bird, 654, 2453, 2603; distinguished from emu, 1145.
**Castaigne** (*kà-stăn'*), **André** (born 1861), Fr. painter; *picture* by, 1516.
**Casta'lia, fountain of,** 991, 1528.
**Cas'tanets,** *picture,* 2382.
**Caste,** in India, **1651, 1750–1;** Japan, 1868.
**Castelar y Ripoll** (*käs-tā-lär' ē rē-pōl'*), **Emilio** (1832–99). Span. Liberal statesman and orator; dictator of Spanish republic Sept.–Dec. 1873.
**Castelfidardo** (*käs-tĕl-fē-där'dō*), Italy. Town 10 mi. s. of Ancona, near Adriatic Sea; Italians defeated papal troops 1860.
**Castellón de la Plana** (*käs-tĕl-yōn' dā lä plä'nä*), Spain. Mfg. and trade city 40 mi. n.e. of Valencia, near Mediterranean; pop. 32,300.
**Castelnau, Edouard de** (born 1851). Fr. general; commanded in Lorraine Aug.–Sept. 1914; organized emergency defense of Verdun 1916; on eastern front 1917–18.
**Castiglione** (*käs-tē-lyō'nā*). **Baldassare** (1478–1529). Ital. writer and diplomat, employed on many important missions; called "the perfect courtier."
**Castile** (*kăs-tēl'*), former kingdom of n.-cent. Spain, **1195, 1832, 3304,** *map,* 3300.
**Castile soap,** 3267.
**Castil'ian,** chief literary dialect of Span. language, 3307.
**Castillon** (*kà-slē-yôn'*), France. Town 26 mi. e. of Bordeaux; French victory over English (1453), last battle of Hundred Years' War.
**Casting,** of bells, 378; iron, **1820,** *pictures,* **1820, 1821;** pottery, 2904; sculpture, 3154; type, **3572, 2019–23, 2303–5.**
**Cast iron,** 1824.
**Castle,** 654–7, *pictures,* 655, 44; "adulterine" (unlicensed), 3352; tapestries, 3433; Tower of London, **2049–50.** —*Pictures:* Balmoral, 3147; Blarney, 1810; Carnarvon, 3665, 656; Edinburgh, 1082; Mouse Tower, 1446; Portuguese (La Pena), 2888; tower at Rouen, 1894; Runkelstein, 270; Stirling, 656; Tower of London, 2056; Windsor, 1154.
**Castle Garden,** New York City, 2488.
**Castlereagh, Robert Stewart, Viscount** (2d Marquis of Londonderry) (1769–1822), Brit. statesman; sec. for Ireland (1798–1800); sec. for war (1805–06, 1807–09); foreign sec. (1812–22); at Congress of Vienna, 3642.
**Castor,** secretion of beaver, 2728.
**Castor and Pollux,** constellation, 657, *charts,* 3343, 873; in Gk. myth., 657, 3042; temple of (Rome), *picture,* 3051.
**Castor bean,** fruit of castor plant, 657, *picture,* 1226.
**Castor canadensis,** N. Amer. beaver, 358.
**Castor oil,** 657, 1227.
**Castrio'ta,** or **Castriot, George.** *See in Index* **Scanderbeg.**
**Castro, Cipriano** (*chē-prē-ä'nō käs'trō*) (born 1855), Venezuelan revolutionary leader and president, 3622, 3623.
**Cat,** 657–9; care of, 2756, 1292; duration of life, 126; eye, 1213, *picture,* 1215; foot, 1322; fur, 1390; homing instinct, 130; resembles the lion, 2024; mummies, 2369, 1106; tongue, 3513.
**Catacombs of Rome,** 3052, 2628.
**Catalog,** how to use, 1991.
**Catalo'nia,** former principality and province in n.e. Spain; chief mfg. and agricultural district; 330, 3304, *map,* 3300.
**Catal'pa,** pod-bearing tree, 660, 3533.
**Catalysis** (*kă-tăl'ĭ-sĭs*), chemical change brought about by an agent which remains unchanged; example in mfr. of sulphuric acid, 3390.
**Catalyst** (*kăt'ă-lĭst*), an agent which causes catalysis; platinum as example, 2831.
**Catamaran** (*kăt-à-mà-răn'*), a sailing craft, 445, *picture,* 443.
**Cat'amount** ("cat of the mountain"), or puma, 2933–4.
**"Cat and Rat,"** game, 2834.
**Catania** (*kà-tā'nĭ-à*), Italy, seaport on e. coast of Sicily near Mt. Etna; pop. 220,000; textiles; 1185.
**Cataract.** *See in Index* **Waterfalls.**
**Cataracts,** of Nile, 2510, *map,* 1095.
**Cataraqui River,** in Ontario, 627.
**Cataw'ba grape,** 1501, 1502, 2571.
**Catbird,** song bird of mocking-bird family, 660, 419, 3493, *picture,* 2410.
**Cat-boat,** 444.
**Catch-as-catch-can wrestling,** 3815.
**Catechu** (*kăt'ĕ-chu*) or **cutch,** extract from acacia plants, 1050; plant, 541.
**Caterpillars,** larvae of moths and butterflies, 660–2, 546, 548, *pictures,* 545, 548; destroy vegetation, 661, 218–9; kept down by birds, 401–2, by other insects, 368, 1724, 3691–2; larval nature, 1964, 1785; metamorphosis into pupae, 661, 2936, 1785–6; silkworm, 3236–7, *picture,* 3234.
**Caterpillar wasp,** 3691–2.
**Cat family,** the *Felidae,* 658, 3950; feet, 1322; tongues, 3513. *See in Index* **Felidae; Felis.**
**Catfish,** smooth-skinned fish, with barbels, 662, 1278, 1276.
**Cathay** (*kà-thā'*). Poetic name for China; originated with Marco Polo; used vaguely in Middle Ages for regions in Far East.
**Cathedral** (*kà-thē'drăl*), 662, 763; architecture, 180–8; developed from Egyptian temple, 1102; stained glass windows, 1474.
**Cathedral College.** Rom. Cath. college for men, in New York City; founded 1903; liberal arts.
**Cathedrals, famous:** Aix-la-Chapelle, *picture,* 1; Amiens, 117, 184; Antwerp (Notre Dame), 153, *picture,* 375; Brussels, 520; Canterbury, 636, 637; Cologne, 834; Dublin (St. Patrick's), 1043; of England, 1160; Florence (San Maria), 1848, 1293, *pictures,* 1834, 1294; of France, 1198; Glasgow, 1470; Lima, Peru, 2009; London (St. Paul's), 2052, *picture,* 2048; Mexico City, 2219, *picture,* 2217; Milan, 1844–6, 2235, *pictures,* 1199, 1843; Montreal, 2317; New York City (St. John the Divine), 2491; Paris (Notre Dame), 2682, 184, *pictures,* 185, 186; Pisa, 1844, 2810, *pictures,* 184, 2811; Reims, 2992–3, 186; Rome (St. Peter's), 3052, 3054, *picture,* 187; Saint-Quentin, 3111; Seville, 3182; of Spain, 3300; Strasbourg, 103; Utrecht, 3612; Venice (St. Mark's), 1851–2, 3623–4, *pictures,* 1197, 1851, 182.
**Cather, Willa Sibert** (born 1876). Amer. novelist, b. Winchester, Va. ('The Song of the Lark'; 'O Pioneers').
**Catherine I** (1683–1727), empress of Russia, wife and successor of Peter the Great (1725), 2747.
**Catherine II, the Great** (1729–96), empress of Russia; murdered her husband Peter III and seized his throne (1762), 3090, 3097; gems, 1409, 1005; founds Odessa, 2560; partition of Poland, 2856.
**Catherine de' Medici** (*mĕd'ĭ-chĭ*) (1519–89), queen of Henry II of France, 696, 826, 2191.
**Catherine Howard** (d. 1542), 5th queen of Henry VIII, 1636.
**Catherine of Alexandria, Saint** (4th cent. A.D.?). Virgin martyr, tortured on a toothed or "Catherine" wheel; patroness of scholars, theologians, and virgins.
**Catherine of Aragon** (1485–1536), daughter of Ferdinand and Isabella of Spain, and first queen of Henry VIII of England; divorced, 1636, 447, 2157.
**Catherine of Siena, Saint** (1347–80), Ital. ascetic and mystic, a dyer's daughter; persuaded Pope Gregory XI to return from Avignon to Rome; tomb, 3056.
**Catherine of Valois.** *See in Index* **Katherine of Valois.**
**Catherine Parr** (1513?–48), 6th queen of Henry VIII, 1636.
**Cath'erwood, Mary Hartwell** (1847–1902). Amer. novelist, b. Luray, Ohio ('The Story of Tonty' and other French-Canadian historical romances; 'Old Kaskaskia' and other novels of the Middle West).
**Cath'ode,** 1125, 3824, *picture,* 3825.
**Cathode rays,** 3824, 3825.
**Catholic Association,** in Ireland, 2559.
**Catholic church.** *See in Index* **Roman Catholic church.**
**Catholic Emancipation Act,** 2559, 2706.
**Catholic League,** in Germany, 3488.
**Catholic League** (Holy League), France, 1637, 2763.

**Catholic University of America,** Rom. Cath. institution for men at Washington, D.C.; opened 1889 (incorporated 1887); theology, philosophy, letters, sciences; Cath. seminaries and colleges throughout the U.S. are affiliated; **3685.**
**Catiline** (*kăt'ĭ-līn*) (Lucius Sergius Catilina) (108?–62 B.C.), Rom. conspirator, **765.**
**Catkin, 3534.**
**Cat'lin, George** (1796–1872). Amer. ethnologist, traveler, and artist, b. Wilkesbarre, Pa.; student and painter of Amer. Indians (about 900 Indian portraits now in National Museum, Washington, D.C., and Amer. Museum of Natural History, New York City).
**Catnip, 2258.**
**Cato** (*kā'tō*), **Marcus Porcius** (234–149 B.C.), **the Censor** ("the Elder"), Rom. statesman and orator; name a proverbial synonym for harsh morality and narrow patriotism; Carthaginian policy, **651;** prose writing, **1966.**
**Cato, Marcus Porcius** (95–46 B.C.), of Utica ("the Younger"). Rom. statesman and stoic philosopher, great-grandson of Cato the Elder; opponent of Caesar in war with Pompey; stabbed himself rather than live under the conqueror; hero of Addison's tragedy, 'Cato'.
**Cat's-eye,** a form of quartz, **2945, 3233.**
**Cats'kill aqueduct, 164, 3701;** reservoir, *pictures,* **164, 2468, 3701.**
**Catskill Mts.,** in e.-cent. N.Y., **2790–1, 158, 1692, 2482,** *picture,* **2479;** New York City drainage area, **3703.**
**Catt, Carrie Chapman,** Amer. suffrage reformer, lecturer, and organizer, b. Ripon, Wis.; president National American Woman Suffrage Association; **3778.**
**Cat-tail,** a swamp reed, **3700, 3939.**
**Cattaro** (*kä-tä'rō*), Jugo-Slavia, fortified town on Gulf of Cattaro, inlet of Adriatic; pop. 6000; excellent harbor; **272.**
**Cattegat.** Same as **Kattegat.**
**Cattle, 662–3;** anthrax, **1450, 2692;** bison, **428–31;** breeding, **663, 950, 1642, 48,** *picture,* **49;** buffalo, **527;** care of dairy herds, **950, 952–3;** dairy breeds, **950, 687,** *picture,* **952;** evolutionary position, **128;** eye of cow, *picture,* **1215;** first domesticated, **3524, 772;** foot, **1322;** horns, **1680;** leather, **1975;** loco weed, **3712–3;** meat packing, **2180–5;** meat production compared with hogs, **1671;** as money, **2281, 663;** parasites, **3813–4, 2677;** "Roman" oxen, *picture,* **1838;** skeleton of cow, *picture,* **3245;** yak, **3827;** zebu, **3838.**
**Cattle raising:** in Australia, **264;** Canada, **608, 2582, 2946;** Channel Isls., **687;** Denmark, **994, 996;** France, **1346;** Germany, **1440;** India, **1751–2,** *picture,* **1749;** Mexico, **2212;** Russia, **3086;** S. Africa, **2590, 3283;** S. Amer., **191, 192, 494, 3286, 3608, 3620;** Switzerland, **3415.** —*U.S.,* **3586, 3588;** Ariz., **202;** Iowa, **1803;** Miss., **2262,** *picture,* **2263;** Mont., **2310;** S.D., **3294,** *picture,* **3297;** Tex., **3473;** Wyo., **3818, 3820.**
**Cat'tleya,** an orchid, *picture,* **2592.**
**Catullus** (*kă-tŭl'ŭs*), **Caius Valerius** (84–54 B.C.), Rom. lyric poet, **1967.**
**Cauca** (*kow'kä*), river in Colombia, 650 mi. long, **636,** *map,* **835.**
**Caucasia** (*ką-kăsh'ä*) or **Caucasus,** former division of Russia between Black and Caspian seas, **664, 3084;** divided by Caucasus Mts. into N. Caucasia and Transcaucasia, latter including Armenia, **211–3,** Georgia, **1434;** *map,* **1196–7;** in anc. times, **232;** rug-making, **3078, 664.**
**Caucasian race, 2956–7;** numbers, **2881;** origin of name, **664;** Polynesians, **2620;** related to Turks, **3558.**
**Caucasus** (*ką'kä-sŭs*), **Mt.,** in Gk. myth., scene of Prometheus' punishment, **1640, 663.**
**Caucasus Mts.,** range between s.e. Europe and Asia; extending from Sea of Azof to Caspian Sea; **663–4,** *maps,* **434, 1196–7, 1190,** *picture,* **3091;** aurochs, **431;** manganese, **3087;** peoples, **664;** separate Europe and Asia, **227, 1190.**
**Cau'cus,** in Congress, **2870;** probable origin of word, **16.**
**Caudine Forks.** Mt. pass in Samnium 25 mi. n.e. of Naples, where 40,000 Romans surrendered (321 B.C.) in 2d Samnite War.
**Cauliflower,** vegetable of cabbage type, **553, 555,** *picture,* **554;** when and how to plant, **1397.**
**Cau'ra River,** in cent. Venezuela, flows n. 450 mi., **2600.**
**Caustic potash, 2898–9, 2900;** an alkali, **10;** in mercerizing, **2198–9;** soap-making, **3271, 3263, 3267.**
**Caustic soda, 3271, 3272;** an alkali, **10;** in mercerizing, **2198–9;** papermaking, **2668;** soap-making, **3263, 3267.**
**Cauto** (*kou'tō*), river in s.e. Cuba flowing w. to coast; navigable for small craft; **936.**
**Cavalieri, Lina** (*lē'nä kä-vä-lē-ā'rē*) (born 1874), Ital. opera singer; principal rôles, 'La Bohême', 'La Traviata', 'Mignon'; married Lucien Muratore.
**Cavalier Parliament, 2689, 693.**
**Cavaliers',** Royalists in Eng. Civil War, **693.**
**'Cavalleria Rusticana'** (*kä-väl-lā-rē'ä rųs-tē-kä'nä*), opera, **2584.**
**Caval'lo,** isl. in Manila Bay, **2136.**
**Cavalry,** in modern army, **216;** under Hannibal, **1575;** insignia (U.S.), **3576;** sabers, **3423.**
**Cavan** (*kăv'ăn*). Inland agricultural and mining county in s. Ulster, Ireland; 746 sq. mi.; pop. 91,000.
**Cave, 664–6;** Fingal's Cave, *picture,* **3148;** Luray Cavern, **3648;** Mammoth Cave, **664–5;** temples at Ellora, **1707.**
**Cave-bear, 1336, 668, 771;** 'How Big-Head Slew the Cave-Bear', story, **668, 670,** *picture,* **669.**
**Cave Dwellers,** of the Old Stone Age, **666–70, 2133, 3361, 1684;** story, 'How Big-Head Slew the Cave-Bear', **668–70.**
**Cavell', Edith** (1865–1915), Eng. nurse, attached to hospital in Brussels; executed by Ger. military govt. of Belgium in World War for aiding wounded Allied soldiers to escape, **3798.**
**Cav'endish, Henry** (1731–1810), Eng. chemist and physicist, **1118, 1799, 710,** *pictures,* **1119, 1120;** proved hydrogen an element and water a compound; first to "weigh" the earth, **1064.**
**Caviar** (*kăv-ĭ-är'*), a preparation of sturgeon eggs, **3374, 1090;** Russian production, **3086, 654.**
**Cavite** (*kä-vē'tä*), chief U.S. naval station in Philippines; on Manila Bay, 8 mi. s.w. of Manila; **2136.**
**Cavour** (*kä-vųr'*), **Camillo Benso, Count di** (1810–61), Ital. statesman, **670, 1399, 1837, 3638.**
**Cavy** (*kā'vĭ*), or guinea-pig, **1548;** care of, **2757;** inheritance of coloring, **1642.**
**Cawein** (*kā-wīn'*), **Madison Julius** (1865–1914). Amer. poet, b. Louisville, Ky. ('Kentucky Poems').
**Cawnpore** (*kąn-pōr'*) or **Cawnpur,** industrial city on Ganges R.; pop. 179,000; massacre in Sepoy mutiny, **1753, 1393.**
**Caxton, William** (1422?–91), first Eng. printer, **456–7, 1164;** first print-shop, *picture,* **457.**
**Cayenne** (*kī-ĕn'*), cap., chief town, and seaport of Fr. Guiana; pop. 14,000; formerly Fr. penal settlement; **1547.**
**Cayenne canary,** canary with reddish feathers, **627.**
**Cayenne pepper, 2723.**
**Cay'man,** reptile of crocodile type, **923.**
**Cayuga** (*kä-yų'gä*) **Lake.** In cent. N.Y., 35 mi. long; on it are Ithaca, Aurora, and Cayuga.
**Cayugas,** Indian tribe of Iroquois group, originally living about L. Cayuga, N.Y.; moved to Canada during Rev. War; **1766.**
**Cazin** (*kä-zăn'*), **Jean Charles** (1840–91). Fr. painter, remarkable for poetic charm of his landscapes.
**Ceará** (*sā-ä-rä'*) or **Fortaleza** (*fōr-tä-lā'zä*), Brazil. Port and cap. of state of Ceará on n.e. coast; pop. 70,000.
**Cebidae** (*sĕb'ĭ-dē*), New World monkey family, **2292.**
**Cebu** (*sā-bų'*), one of Philippine Isls.; 1695 sq. mi.; cap. and chief seaport Cebu on e. coast; pop. 50,000; important trade center; **2770;** Magellan at, **2116.**
**Ce'bus,** a monkey genus, **2292.**
**Cec'il.** Great Eng. family; most famous members, William Cecil, Lord Burleigh, Queen Elizabeth's great minister, and Marquis of Salisbury, Victorian premier.
**Cecil, Lord Hugh** (Richard Heathcote) (born 1869). Brit. politician and soldier, brother of Robert; in House of Commons 1895–1906, 1910– ; Lieutenant Royal Flying Corps in World War.
**Cecil, Lord Robert** (born 1864). Brit. statesman; son of Marquis of Salisbury; in House of Commons 1906–10, 1912– ; minister of blockade 1916–18; outstanding figure, representing S. Africa, at first meeting of Assembly of the League of Nations at Geneva 1920.
**Cecil'ia, Saint,** Christian martyr supposed to have perished in Sicily about 180 A.D.; patron saint of musicians; festival celebrated on Nov. 22; **1198;** bas-relief, *picture,* **3157.**
**Cecropea** (*sē-krō'pĭ-ä*) **moth,** *picture,* **544.**
**Cecrops** (*sē'krŏps*). Mythical founder of Athens and first king of Attica; represented as half man, half dragon.
**Cedar, 670–1,** a conifer, **3539;** "red" or juniper, **1903;** wood used for pencils, **2712.**
**Cedar bird, 3706.**
**Cedar Creek,** small branch of Shenandoah R. in Va.; battle, **3205, 779.**
**Cedar Falls,** Iowa. Mfg. city on Cedar R. 90 mi. w. of Dubuque; pop. 6400; Iowa State Teachers' College.
**Cedar Mountain.** Hill in Culpeper County, Va.; Confederate victory, Aug. 1862.
**Cedar Rapids,** Iowa. City on Cedar R. 62 mi. s.w. of Dubuque; pop. 45,566; large cereal mills, r.r. shops, pork-packing plant, glucose and starch works; Coe College.
**Cedar River,** tributary of the Iowa R., in Minn. and Iowa; 400 mi.; *map,* **1804.**
**Ced'ron.** Same as **Kidron.**
**Celebes** (*sĕl'ĕ-bēz*), large isl. in E. Indies; 72,000 sq. mi.; pop. 2,000,000 (1400 Europeans), **671, 1070,** *maps,* **1072, 232–3, 2624–5.**
**Celery,** plant with edible rootstalks, **671,** *picture,* **2224;** blanching, **2828;** food value, **1321;** when and how to plant, **1397.**
**Celesta** (*sĕ-lĕs'tä*), a musical instrument containing steel plates backed by wooden resonators, played with keyboard, **2591, 2383.**
**Cel'ibacy, 764;** Luther's attitude, **2987, 2085.**
**Cell,** unit structure of living organisms, **671–2, 398;** blood, **2999,** *picture,* **1451;** how differentiated for higher life, **91–2;** protoplasm, **2926;** in reproduction, **394, 1140–1, 1641–2,** *pictures,* **395, 1643, 118;** single-celled animals, **2927, 3944, 118–9;** single-celled plants, **90–2, 3937, 3938.**
**Cell, electric,** device for changing chemical energy into electric cur-

rent, **1113, 1108, 1110,** *pictures,* **1109, 1113;** distinguished from storage battery, **1113, 3361–2;** invented by Volta, **1120, 1112–3.**
**Cellini** (*chĕl-lē'nē*), **Benvenuto** (1500–71), Ital. goldsmith, sculptor; brawling braggart soldier of fortune, and mirror of his time ('Autobiography'); **3158, 1849;** pitcher by, *picture,* **1205.**
**Cello** (*chĕl'ō*) or **violoncello** (*vē-ō lōn-chĕl'ō*), **3646,** *picture,* **2382.**
**Cell theory, 398, 3841, 671–2.**
**Celsius** (*sĕl'sĭ-ŭs*), **Anders** (1701–44). Swedish astronomer; devised Centigrade ('Celsius') thermometer.
**Cel'luloid,** ivory-like artificial substance, **672–3, 594, 2352.**
**Cel'lulose,** stiffening substance of plants, **673;** formed by leaves, **1980;** in explosives, **1212;** nitrate, **833;** in paper-making, **2667,** *picture,* **2229;** in trees, **3532.**
**Celt,** prehistoric implement, *picture,* **515.**
**Celtic languages and literature, 674, 2771, 1162;** Arthurian legends, **223–4;** in Ireland, **1814, 1036, 1038;** in Wales, **3664.**
**Celts** (*sĕlts* or *kĕlts*), **673–4;** in Britain, **1151, 1152;** in France, **514–5, 1343, 1344;** in Hebrides Isls., **1625;** in Ireland, **1807, 1808;** in Wales, **3664;** modern "Renaissance," **674;** venerated mistletoe, **2274.**
**Cement** (*sē-mĕnt'*), **674–6, 856, 70;** in building construction, **529, 531–2.**
**Cementa'tion process,** of steel manufacture, **1824.**
**Cemetery Ridge,** important position in battle of Gettysburg, **1453.**
**Cenis** (*sĕ-nē'*), mountain and pass of Alps on border of France and Italy; tunnel, **3552.**
**Cenozoic** (*sē-nō-zō'ĭk*) **era,** in geology, **1418, 1420, 1422;** transition from Mesozoic conditions, **136, 1420.**
**Censer,** vessel for burning incense, *picture,* **1204.**
**Censors,** in anc. Rome, **3044.**
**Censorship of press, 2918.**
**Census, 676–8;** first U.S., **3602;** occupations listed (1910), **3654.**
**Census, Bureau of** (U.S.), **677, 3599–3600.**
**Cent.** A coin of the U.S. weighing 48 grains (95 per cent copper, 5 per cent tin and zinc) and valued at the hundredth part of a dollar; first issued in 1787.
**Centaurs** (*sĕn'tərs*), fabled monsters half man, half horse, **678–9;** Theseus slays, **3487,** *pieture,* **3160.**
**Centau'rus,** a southern constellation; brightest star, Alpha Centauri, **240, 241, 3340, 3342.**
**Centen'nial Exhibition,** at Philadelphia (1876), **1056;** first telephone, **3458–9.**
**Centennial State, 845.**
**Center,** in European politics, **2869.**
**Center line,** of tunnels, **3550.**
**Center of gravity, 1509.**
**Cen'tigrade thermometer, 3486–7.**
**Centigram,** unit in metric system (0.154 grains), **2206.**
**Centiliter,** unit in metric system (0.338 fl. oz.), **2206.**
**Cen'timeter,** unit in metric system (0.3937 in.), **2206.**
**Cen'tipede,** a type of many-legged arthropod, **679, 3325;** evolutionary position, **128;** not an insect, **1787;** phosphorescent, **2776.**
**Central America,** southern part of N. Amer. extending from Mexico to Colombia; 213,000 sq. mi.; pop. 5,500,000; **679–82,** *maps,* **680, 2514–5,** *Study Outline,* **3893;** bananas, **324, 680;** Caribbean Sea, **644;** chicle, **719;** coffee, **822, 679;** history, **680, 682;** logwood, **2046;** Mayas, **3834–5;** Monroe Doctrine, **2307;** population, **679, 2434;** rubber, **3074;** sisal, **3244;** yucca, **3835.** *See also in Index* **America** and names of separate countries.
**Central College.** At Fayette, Mo.; co-ed.; founded 1857 (chartered 1855); Meth. Episc. (South); arts and sciences.
**Central Falls,** R.I. City 4 mi. n. of Providence on Blackstone R., which supplies power for textile mills; pop. 24,174.
**Centra'lia,** Ill. Fruit-shipping and mfg. city 57 mi. e. of St. Louis, Mo.; coal mines; pop. 12,491.
**Central Pacific Railroad, 581, 3103.**
**Central Park,** New York City, **2494.**
**Central Plains,** in U.S., **3581, 3587, 3588, 3882.**
**Central Powers.** Countries opposed to the Allies in World War (Germany, Austria-Hungary, Bulgaria, Turkey).
**Central Provinces and Berar,** province of India; pop. 14,000,000; 100,000 sq. mi.; **1746,** *map,* **1745.**
**Central time, 3500.**
**Centre College.** At Danville, Ky.; men; present organization 1901 (consolidation of Centre College of Danville 1819, and Central University of Richmond 1874); liberal arts.
**Centrif'ugal force, 682.**
**Centrifugal machinery, 682;** cream separator, **950;** governor of steam engine, **3352;** in laundry, **1969;** in sugar-making, **3386, 3388,** *pieture,* **3387.**
**Centrip'etal force.** Force operating on a body moving in a curve, tending to draw the body to the center; thus the attraction of the sun is the centripetal force which holds the earth to its orbit.
**Cen'trosome,** in cells, **1642,** *pictures,* **395, 1643.**
**Century plant, 42.**
**Cephalic** (*sĕ-făl'ĭk*) **index, 2956.**
**Cephalonia** (*sĕf-ə-lō'nĭ-ə*). Mountainous Gk. isl. w. of mainland; largest of Ionian group; 226 sq. mi.; pop. 71,000; olives, fruit, oil.
**Ceph'alopods,** a class of mollusks, **2280, 3945;** evolutionary position, **128;** cuttlefish, **941–4;** nautilus, **2418;** octopus, **2559, 941–4;** squid, **3333, 941–4.**
**Cephalotho'rax,** head and body segments of arthropod when fused, **3326, 3946.**
**Cepheus** (*sē'fūs*), in Gk. myth., king of Ethiopians, father of Andromeda, **2732.**
**Cephis'sus River,** in anc. Attica, flowing into Saronic Gulf just s. of Athens, **195.**
**Ceram** (*sē-răm'*), isl. in Moluccas, Dutch E. Indies, w. of New Guinea; 6621 sq. mi.; mountainous, thick forests; sago palm, agricultural products, etc.; *map,* **1073.**
**Ceram'ic industries,** defined, **2905–6.** *See also in Index* **Brick and tile; Clay; Pottery; Porcelain.**
**Ceramicus** (*sĕr-ə-mī'kŭs*), dist. on n.w. side of Athens, so named on account of pottery industry carried on there, **195.**
**Cerberus** (*sĕr'bĕ-rŭs*), in Gk. myth., many-headed watchdog, guardian of entrance to infernal regions, **1558;** Hercules captures, **1640.**
**Cercopithecidae** (*sĕr-kō-pĭ-thĕ'sĭ-dē*), family of monkeys, **2292.**
**Cer'dic** (d. 534). Founder of W. Saxon kingdom; called ancestor of all sovereigns of England except Canute, Hardicanute, the two Harolds, and William the Conqueror.
**Cereal crops,** those producing food grains: barley, **330–1;** bread and baking, **496–500;** breakfast foods, **501–2;** buckwheat, **524;** corn **888–91, 3276;** developed from wild grasses, **1502, 2830;** favorable temperatures; **795;** flour, **1301–4;** fodder, **1609;** food value, **1321–2, 3652;** insect pests, **218, 752, 1645;** kafir corn, **1907;** millet, **2239;** oats, **2548–9;** origin of word, **993;** rice, **3013–5;** rotation, **48;** rusts and smuts, **3099–3101;** rye, **3102;** sorghum, **3276;** threshing, **3493–4;** wheat, **3730–2.**
**Cerebel'lum,** the "little" or "back" brain, **491.**
**Cer'ebro-spinal fluid, 491.**
**Cerebro-spinal meningitis,** serum treatment for, **152.**
**Cerebro-spinal nerves, 2437.**
**Cer'ebrum,** the "big" or "front" brain, **490–1;** in sleep, **3251.**
**Ceres** (*sē'rēz*), Rom. goddess of agriculture, **991–3.**
**Ceres,** an asteroid, **237.**
**Cereus** (*sē'rē-ŭs*), a cactus genus, **562;** night-blooming, **563.**
**Cerignola** (*chā-rē-nyō'lä*). City in s. Italy near Adriatic Sea; pop. 38,000; Spaniards crushed French army under the Duc de Nemours in 1503.
**Cerigo** (*chĕr'ĭ-gō*). Gk. isl. of Ionian group, 10 mi. s.e. of mainland; 106 sq. mi.; anc. Cythera, sacred to Aphrodite.
**Cerium** (*sē'rĭ-ŭm*), a rare metallic element, **4042, 2247, 1407.**
**Cernauti.** Same as **Czernowitz.**
**Cernavo'da,** Rumania, **3081.**
**Cerro Azul** (*sĕr'ō ä-zo͞ol'*), great oil well in Mexico, **2749.**
**Cerro Blanco** (*blăn'kō*), highest mountain in N.M., **2462.**
**Cerro de Merca'do,** iron hill near Durango, Mexico, **2210–1.**
**Cerro de Pasco** (*dā päs'kō*), Peru, mining town; pop. 14,000; **2744.**
**Cerro Gordo** (*gôr'dō*), mountain pass in Mexico 60 mi. n.w. of Vera Cruz; battle, **2208.**
**Certhiidae** (*sĕr-thī'ĭ-dē*), creeper family of birds, **412.**
**Certificates** (paper money), **2282, 2284.**
**Certificates** (stocks and bonds), **3359.**
**Certified milk, 952–3.**
**Certified public accountant, 7.**
**Cervantes Saavedra** (*sĕr-văn'tēz sä-ä-vä'drä*), **Miguel de** (1547–1616), greatest of Span. writers, **682–4,** *pieture,* **3307;** story of 'Don Quixote', **683–4.**
**Cervera** (*thĕr-vä'rä*), **Pascual** (1839–1909), Span. admiral, **3306.**
**Cervin** (*sĕr-văn'*), **Mont.** *See in Index* **Matterhorn.**
**Cerynean** (*sĕr-ĭ-nē'ən*) **stag,** in Gk. myth., slain by Hercules, **1640.**
**Cestus** (*sĕs'tŭs*), anc. boxing-glove, **476.**
**Cetacea** (*sē-tā'sē-ə*), an order of aquatic mammals, **2132;** dolphins, **1026–7;** evolutionary position, **128;** whales, **3723–6.**
**Cetewayo** (*sĕt-ĭ-wä'yō*) (d. 1884), Zulu chief, **36, 3280–1.**
**Cette** (*sĕt*), France, seaport on s. coast; pop. 33,000; trade in wine, salt, fish; **1344.**
**Cettinje** (*tsĕt'ĭn-yā*), cap. of Montenegro; pop. 5500; situated in high mountain valley e. of Cattaro; several times destroyed by Turks; **2313.**
**Ceuta** (*sū'tə*), Morocco, Span. port, military station, and penal settlement on n. coast opposite Gibraltar; pop. 24,000; long a Moorish stronghold; **1638, 2328.**
**Cévennes** (*sā-vĕn'*) **Mts.,** chief range in s. France, extending n.e. to s.w., w. of Rhone R.; highest point Mt. Mézenc (5754 ft.); **1345, 1346,** *map,* **1351.**
**Ceylon** (*sē-lŏn'*), isl. s.e. of India; Brit. colony; 25,000 sq. mi.; pop. 4,700,000; **684–5,** *maps,* **1744, 232–3;** bonnet monkey, *picture,* **2291;** Buddhism, **525;** ebony, **1073;** gems, **1409, 1410;** graphite, **1502;** spice trade, **3317;** tea culture, **3445–51.**
**Cézanne** (*sā-zän'*), **Paul** (1839–1906), Fr. portrait, landscape, and figure painter, great leader and creative artist; sought to combine impressionist light and color with classic design and form; **2634.**
**Chac'ma baboon, 2292.**

**Chaco** (*chä'kō*), **El Gran,** vast alluvial plain of cent. S. Amer. between Paraguay and Parana rivers and Andes Mts., **190, 2676,** *map,* **191.**
**Chad** (*chäd*), **Lake,** in w.-cent. Africa, **34, 3384,** *map,* **40–1.**
**Chadband.** A hypocritical clergyman in Dickens' 'Bleak House'.
**Chadwick, George Whitefield** (born 1854), Amer. musical composer, b. Lowell, Mass.; regarded by some as leader of Amer. school; chief works, **2380.**
**Chaeronea** (*kĕr-ō-nē'ȧ*), anc. town in Boeotia; birthplace of Plutarch; battle of (338 B.C.), **1525, 3486, 86.**
**Chaetopods** (*kēt'ō-pŏds*), sub-class of annelid worms with bristles, **3945.**
**Chaf'ers,** an immense family of beetles, including scarab group, **369,** June bugs, **1902,** rose chafer and leaf chafer, **369.**
**Chaf'fee, Adna R.** (1842–1914). Amer. general, b. Orwell, Ohio; served in Civil and Span.-Amer. wars; commanded expedition which relieved U.S. Legation at Peking in 1900.
**Chaffinch.** A well-known European bird of the finch family, sought as a cage-bird because of its beauty of voice and its ability to learn to sing tunes.
**Chagos** (*chä'gŏs*). Group of coral isls. 1000 mi. s. of India; 76 sq. mi.; coconut oil; dependency of Mauritius.
**Chagres** (*chä'grĕs*) **River,** flows across Isthmus of Panama into Caribbean Sea; supplies water for locks of Panama Canal; dammed to form Gatun Lake, **2658, 2663,** *map,* **2662.**
**Chain,** unit of measurement in surveying, **3398.**
**Chain lightning, 2007.**
**Chain mail, 214,** *picture,* **215.**
**Chain-pump, 2934,** *picture,* **3696.**
**Chain-shot, 636.**
**Chair.** *See in Index* **Furniture.**
**Chalcedon** (*kăl'sĕ-dŏn*). Anc. seaport in Asia Minor on Bosporus, opposite Byzantium; Kadiköi now occupies site.
**Chalcedony** (*kăl-sĕd'ō-nĭ*), a variety of quartz, **1411, 2945, 3233.**
**Chalcidice** (*kăl-sĭd'ĭ-sē*). Anc. name of peninsula in n.e. Greece with 3 smaller peninsulas projecting into Aegean Sea.
**Chalcis** (*kăl'kĭs*) or **Khalkis,** Greece, chief town of isl. of Euboea; pop. 11,000; Aristotle flees to, **196.**
**Chalco** (*chäl'kō*), **Lake,** Mexico, **2218.**
**Chaldean** (*kăl-dē'ȧn*) **Empire** (606–538 B.C.), **298, 2510, 1890;** sculpture, **3155–6.**
**Chalet** (*shä-lā'*), Alpine cottage, **3415.**
**Chaleurs** (*shä-lu̯r'*), **Bay of.** Inlet of Gulf of St. Lawrence 90 mi. long, between Quebec and New Brunswick; named (Fr. *chaleur,* "heat") by Cartier because of its warmth.
**Chal'grove Field, battle of,** in Oxfordshire, England, 1643; Royalists under Prince Rupert defeated Puritan army; **1570.**
**Chalk** (*chȧk*), a soft limestone, **685, 2010, 1334;** in cement, **674;** composition, **571;** Dover cliffs, **1027;** formations of Cretaceous period, **1420;** foraminifera, **2927.**
**'Challenger' Expedition.** Famous Brit. expedition for study of deep sea (1872–76); results fill 50 volumes.
**Chal'mers, Thomas** (1780–1847). Scotch preacher and political economist, one of chief promoters of Free Church of Scotland.
**Châlons** (*shä-lôn'*), **battle of** (451), **1704.**
**Châlons-sur-Marne** (*sür-märn'*). City in n.e. France, 95 mi. e. of Paris; pop. 30,000; exports champagne; large military camp of Napoleon III near by; taken by Germans 1870 and 1914; scene of famous battle of 451 A.D.
**Châlons-sur-Saône** (*sōn'*) France. City 80 mi. n. of Lyons on Saône R.; pop. 32,000; iron mfrs.; large ordnance works.
**'Chambered Nautilus, The',** poem by O. W. Holmes, **1674, 2418.**
**Cham'berlain, Joseph** (1836–1914), Eng. Liberal Unionist statesman; mayor of Birmingham 1873–76; pres. Board of Trade in Gladstone's Cabinet 1880–86; Colonial Sec. in Salisbury's Cabinet 1895–1900; strongly imperialistic policy a large factor in bringing on Boer War; opposed Home Rule and favored protection; **3282, 3640.**
**Cham'berlain, J. Austen** (born 1863). Eng. statesman, son of Joseph Chamberlain; entered Parliament 1892; member Coalition govt. in World War; as chancellor of exchequer secured adoption of father's tariff reform policy with imperial preference 1919; succeeded Bonar Law 1921 as leader of Liberal Unionist party.
**Chamber of Deputies,** France, **1351.**
**Chambers, Robert** (1802–71). Scotch publisher and writer; joint editor *Chambers' Journal;* author, 'Vestiges of Creation'.
**Chambers, Robert W.** (born 1865). Amer. novelist, b. Brooklyn, N.Y. ('Cardigan'; 'The Maid at Arms'; 'The Firing Line'; 'The Crimson Tide').
**Chambersburg,** Pa. City 46 mi. s.w. of Harrisburg, in Cumberland valley; pop. 10,632; Wilson College; burned by Confederates (1864).
**Chambéry** (*shäṅ-bā-rē'*), France. Historic town 55 mi. s.e. of Lyons; pop. 23,000; cap. former duchy of Savoy.
**Chameleon** (*kă-mē'lē-ŏn*), a type of lizard, **685–6;** eye, *picture,* **1215;** tongue, **3513.**
**Chaminade** (*shä-mē-näd'*), **Cécile Louise Stéphanie** (born 1861). Fr. pianist and composer, for some time resident of England; 'The Flatterer,' 'Scarf Dance', etc. have made her one of best-known women composers.
**Chamois** (*shăm'ĭ*), a fleet goat-like antelope, **686, 1194;** altitude range, **397;** leather, **1976, 1977, 1475.**
**Chamonix** (*shä-mō-nē'*) or **Chamouni,** beautiful valley and village in s.e. France, at foot of Mont Blanc, **102.**
**Champagne** (*shăm-pān'*), former province in n.e. France; great fief in Middle Ages; chief city, Troyes; *map,* **1351;** celebrated for wines, **1346;** World War battles, **3792, 3797, 3810.**
**Champaign,** Ill. City 48 mi. s.e. of Bloomington; pop. 15,873; trade center for agricultural region; tools, textiles, foundry products; twin town of Urbana.
**Champ de Mars** (*shäṅ dē märs*), large square in Paris on Seine R.; originally used for military drills; scene of historic gatherings and exhibitions; **2684.**
**Champion's Hill, battle of.** Fought May 16, 1863, in Mississippi, e. of Vicksburg; Federals under Grant defeated Confederates under Pemberton.
**Champlain', Samuel de** (1567–1635), Fr. explorer, founder of Quebec, **686–7, 3107;** explorations, **1514, 3109;** incurs enmity of Iroquois, **1766;** statue, *picture,* **622.**
**Champlain, Lake,** between Vt. and N.Y., discovered by Champlain; length 110 mi.; width ¼ to 13 mi.; **2485,** *map,* **2480.**
**Champlain, Lake, battle of** (1814), **3672.**
**Champlevé** (*shămp-lĕ-vā'*) **enamel, 1146.**
**Champollion** (*shäṅ-pōl-yôṅ'*), **Jean François** (1790–1832), Fr. scholar, Egyptologist; deciphers Rosetta Stone, **1099.**
**Champs Elysées** (*shäṅ zā-lē-zā'*), famous boulevard in Paris, **2682,** *picture,* **2683.**
**Chancellorsville, battle of** (May 2 and 3, 1863), **687, 1858, 1984.**
**Chan'cery, High Court of,** England, **909.**
**Chancery, Papal, 2666.**
**Chandernagore** (*chŭn-dēr-nu̯-gōr'*), India, Fr. colony on Hugli R., 20 mi. above Calcutta; 3 sq. mi.; pop. 27,000; jute mill; **1756.**
**Changsha** (*chäng-shä'*), China. City 350 mi. n. of Canton on Siang R.; cap. Hunan province; pop. 500,000; silk mfrs.; large native trade.
**Channeling machine,** used in quarrying, **2943, 2944, 2945.**
**Channel Islands,** Brit. possession off coast of France; pop. 100,000; 75 sq. mi.; **687, 1344,** *maps,* **1152, 1351;** climate, **1188;** Jersey cabbage, **553.**
**Chan'ning, William Ellery** (1780–1842), Amer. Unitarian preacher, reformer, and writer, b. Newport, R.I.; opposed slavery but deprecated violence of abolitionists; **588.**
**'Chanson de Roland'** ("Song of Roland"), **3038.**
**Chant, 2377.**
**Chanterelle** (*shăn-tĕ-rĕl'*), a mushroom, **2375,** color plate, **2374.**
**Chanticleer** (*chăn'tĭ-klēr*) (Fr. *chante-clair,* "clear singer"), the cock in 'Reynard the Fox', **1337.**
**Chantilly** (*shäṅ-tē-yē'*), France, anc. town 20 mi. n. of Paris; splendid chateau; art collection; once noted for Chantilly lace; famous race course; **2883.**
**Chantilly** (*shăn-tĭl'lĭ*), Va. Village 20 mi. w. of Washington; indecisive battle after 2d battle Bull Run (1862); generals Kearney and Stevens killed; also called battle of Ox Hill.
**Chantilly lace, 1950.**
**Chanute** (*shä-nu̯t'*). Kan. City 95 mi. s. of Topeka; pop. 10,286; more than 2000 oil wells in vicinity and extensive gas deposits; large cement plant, r.r. shops.
**Chaos** (*kā'ŏs*), in Gk. myth., **3607.**
**Chaparral** (*chăp-ȧ-răl'*). Thicket of dwarf oak, shrubs, etc., found in parts of Tex., N.M., Ariz., and Mexico.
**Chapel Hill,** N.C., lumbering and mfg. town; pop. 1500; **2520.**
**Chap'lain,** clergyman attached to army or navy, **217;** insignia (U.S.), **3576, 3577.**
**Chaplin, Charles Spencer** (born 1889). Motion picture comedian, b. London, England; came to U.S. 1910; screen début 1914; engaged 1917 to make 8 two-reel pictures for $1,000,000; formed own producing company 1918.
**Chapman, George** (1559?–1634). Eng. poet and dramatist, now remembered chiefly as earliest Eng. translator of Homer and one of best. (Read Keats' sonnet 'On First Looking into Chapman's Homer'.)
**Chapter, cathedral, 763.**
**Chapu** (*shä-pü'*), **Henri** (1833–91), Fr. sculptor, **3158;** 'Joan of Arc', *picture,* **3162.**
**Chapultepec** (*chä-pu̯l-tĕ-pĕk'*), Mexico, rocky eminence 2 mi. s.w. of Mexico City; battle (1847), **2208,** *pictures,* **2218, 3603.**
**Char** (*chär*), true trout, **3545, 1279.**
**Character,** in adolescence, **25–6;** ambition, **107–8;** athletics, **253;** child training, **729–35;** college influences, **828;** courage, **907–8;** habit, **1557;** heredity, **1644;** honesty, **1677;** keeping our word, **1915;** play, **2832, 2834;** reading, **2981–2, 2542.** *See also in Index* **'Little Talks on Great Things'.**

**Charade** (*shà-rād'*), syllable-puzzle game, **687–8.**
**Charcoal, 688, 642;** "bone," **452–3;** in gas masks, **1408;** made from alder, **85;** from dogwood, **1025;** in gunpowder, **1552–3;** smelting, **1820;** spontaneous combustion, **1249.**
**Chard,** a beet with edible top, **365;** when and how to plant, **1397.**
**Charenton-le-Pont** (*shä-räṅ-tôṅ'-lē pôṅ*). Town 1 mi. s.e. of Paris walls, on Marne R.; pop. 20,000; national insane asylum; hence "Charenton" in French is used like "Bedlam" in English.
**Charge,** in heraldry, **1639.**
**Charge, electric, 1110–2;** explained by electron theory, **1112, 256,** *picture,* **1111;** opposite kinds discovered by du Fay, **1117.**
**Chargé d'affaires** (*shär-zhā' dä-fêr'*), **1013.**
**Charged water,** how made, **642.**
**'Charge of the Light Brigade', 922.**
**Charging,** of storage batteries, **3362.**
**Charing** (*chêr'ing*) **Cross.** A dist. in London on site of former village of Cherringe, where Edward I erected great cross in memory of his queen Eleanor.
**Chariot,** Egyptian, *pictures,* **1103, 2629;** Roman, *picture,* **3040.**
**Charioteer'** or **Auriga,** a constellation, *charts,* **873, 3343.**
**Chariton River.** Tributary of the Missouri in s. Iowa and Missouri; 250 mi.
**Charity, Sisters of.** Name of several Rom. Cath. orders and branches of orders, whose members are devoted to care and education of sick and poor; oldest order founded in Paris in 1633 by St. Vincent de Paul; Sisters of Charity of U.S. founded by Mother Seton in 1809.
**Charlemagne** (*shär'lĕ-mān*) (742–814), Charles the Great, king of the Franks and Holy Roman emperor, **688–90;** break-up of his empire, **1352, 690;** builds canals, **625;** character, **690;** court and tomb at Aachen, **1;** founds Holy Roman Empire, **1674;** in Italy, **1842, 2047;** in legend, **3038, 3039;** and Roland, **3038;** conquers Saxons, **689, 3132;** what he did for Europe, **1195.**
**Charleroi** (*shär-lē-rwä'*), Belgium, r.r. and iron-mining center 30 mi. s. of Brussels; pop. 28,000; taken by Germans Aug. 1914 after terrific fighting; **3810.**
**Charleroi** (*chär-lē-roi'*), Pa. Mining and mfg. borough, 22 mi. s. of Pittsburgh on Monongahela R.; glass and shovels; pop. 11,516.
**Charles I** (1887–1922), emperor of Austria-Hungary 1916–18, succeeded Francis Joseph; abdicated on collapse of Central Powers; attempted to regain Hungarian throne 1921; exiled to Madeira; **1354.**
**Charles I** (1600–49), king of England, **691–3;** Cromwell, **924;** execution defended by Milton, **2242;** habeas corpus suspended, **1557;** John Hampden, **1570;** Ireland rebels, **1808;** Puritans, **2937;** Scotland rebels, **3148–9;** Star Chamber abolished, **3344;** Van Dyck at court, **3618.**
**Charles II** (1630–85), king of England, **693–4;** Bacon's Rebellion, **301;** new beverages, **755;** Bombay acquired, **451;** coffee houses, **820;** colonial grants in Amer., **1692, 2716, 3292, 2521;** Conn. charter, **868;** fire of London, **1262;** Habeas Corpus Act passed, **1557;** Restoration literature, **1165, 1036;** Scotland, **3149;** Whitehall, **2053–4.**
**Charles I, the Bald** (823–77), king of France (also Holy Roman emperor as Charles II), **694, 691.**
**Charles II, the Fat** (832–88), France (also Holy Roman emperor as Charles III), **694, 691.**
**Charles III, the Simple** (879–929), France, **694, 2526, 2513.**
**Charles IV, the Fair** (1294–1328), France, youngest son of Philip IV; succeeded brother Philip V as king of France and Navarre, **694.**
**Charles V, the Wise** (1337–80), France, **694, 1700.**
**Charles VI** (1368–1422), France, **694.**
**Charles VII** (1403–61), France, **694–6, 1700, 1893–4.**
**Charles VIII** (1470–98), France, **696, 1195, 1842, 3131.**
**Charles IX** (1550–74), France, **696, 826.**
**Charles X** (1757–1836), France, last of Bourbon rulers, **696, 2067;** Lafayette helps depose, **1957.**
**Charles I,** Holy Roman emperor. Same as **Charlemagne.**
**Charles II, the Bald** (823–877), Holy Roman emperor and (as Charles I) king of France, **691, 694.**
**Charles III, the Fat** (832–888), Holy Roman emperor and (as Charles II) king of France, **691, 694.**
**Charles IV,** Holy Roman emperor (1316–78), **691;** Golden Bull, **1447–8, 1675;** ruled Luxemburg, **2086.**
**Charles V** (1500–58), Holy Roman emperor, king of Spain and the Netherlands, **690–1, 3304;** Cortez, **895;** De Soto, **999;** Fugger loans, **1442;** a Hapsburg, **1578;** Magellan, **2115;** and Pizarro, *picture,* **3301;** postal system, **2896;** Reformation, **2084, 2987, 2988, 1448;** Titian, **3504;** Wolsey supports, **3776;** wars with France, **1354, 1842, 2988, 3057;** Ximenes regent, **3824.**
**Charles VI,** Holy Roman emperor (1685–1740), **691;** pragmatic sanction, **2147.**
**Charles VII,** Holy Roman emperor (1697–1745), **691, 1578.**
**Charles I** or **Carol I** (1839–1914). King of Rumania; elected prince 1866, crowned first king 1881; married Elizabeth of Wied ('Carmen Sylva').
**Charles** (Carlos) **III** (1716–88), king of Spain; son of Philip V and Elizabeth Farnese; succeeded his brother Ferdinand VI (1759); king of Two Sicilies, **3230.**
**Charles IX** (1550–1611), king of Sweden, **698.**
**Charles X** (1622–60), Sweden, **698.**
**Charles XI** (1655–97), Sweden, **698.**
**Charles XII** (1682–1718), Sweden, **698, 3404, 896, 2747.**
**Charles XIV John** (1763–1844), Sweden. *See in Index* **Bernadotte.**
**Charles XV** (1826–72), Sweden, **698.**
**Charles, Jacques A. C.** (1746–1823), Fr. physicist; first hydrogen balloon, **310,** *picture,* **311.**
**Charles Albert** (1798–1849), king of Sardinia; succeeded 1830; began struggle for Ital. independence; **1837, 3638.**
**Charles Edward** (1720–88), "the Young Pretender," **2914.**
**Charles Martel** (688–741), Frankish ruler, defeated Saracens at Tours, **697, 2278.**
**Charles of Anjou** (1226–85), count of Anjou and king of Two Sicilies, **1293, 2391, 3230.**
**Charles the Bold,** duke of Burgundy (1433–77), **696–7;** death, **3415;** and Louis XI, **2065;** sacks Liége, **1995;** seeks union of "Low Countries," **2441;** tomb, **518.**
**Charleston,** Ill., city in e. center, 46 mi. w. of Terre Haute; pop. 6615; oil and coal region; Lincoln-Douglas debate 1858; normal school, **1736.**
**Charleston,** S.C., most important harbor of s.e. U.S.; pop. 67,957; **699, 3292;** captured by British, **3004;** earthquake, **1066;** Pulaski, **2933;** Ft. Sumter, **1332–3.**
**Charleston,** W.Va., cap., river port, and mfg. city on Kanawha and Elk rivers; pop. 39,608; large coal, oil, gas, and lumber interests; r.r. shops; boats, axes, chemicals, steel plate; **3723.**
**Charleston, College of,** at Charleston S.C.; for men; opened 1790 (chartered 1785); arts and sciences; **699.**
**Charlestown,** Mass., formerly separate city, now part of Boston; navy yard; battle of Bunker Hill, June 17, 1775, **472.**
**Charlevoix** (*shär-lē-vwä'*), **Pierre F. X. de** (1682–1761). Fr. Jesuit missionary and historian; explored Great Lakes and Mississippi R. (1721).
**Charlotte,** grand duchess of Luxemburg (born 1896), succeeded to throne 1919 at abdication of her elder sister, **2085.**
**Charlotte,** N.C., commercial city in center near S.C. border; pop. 46,338; several battles in Revolution; in cotton district, **2520.**
**Charlotte Amalie.** Former name of St. Thomas, Virgin Isls.
**Charlottenburg** (*shär-lŏt'ĕn-burĸ*), Germany. Residential suburb w. of Berlin; pop. 323,000; royal palace; porcelain, iron mfrs.
**Charlottesville,** Va., 67 mi. n.w. of Richmond; pop. 10,688; woolens; seat of Univ. of Virginia, founded 1819 by Thomas Jefferson; **3650.**
**Charlottetown,** Prince Edward Island, provincial cap. and largest city; pop. 12,000; fox fur and fish interests; large pork-packing plant; various mfrs.; Prince of Wales College; birthplace of Canadian Confederation; **2915.**
**Charm,** an incantation, or object believed to bring good luck, **2118, 2120, 1771,** *pictures,* **1747, 1750.**
**Charnwood, Godfrey Benson,** first **Baron** (born 1864), Eng. politician and author; life of Lincoln, **2016.**
**Charon** (*kā'rŏn*), in Gk. myth., ferryman of River Styx, **1558.**
**Charpentier** (*shär-päṅ-tyā'*), **Gustave** (born 1869), Fr. composer; chief works, **2380.**
**Char'terhouse,** a Carthusian monastery in London, after 1611 used as a hospital for old men and a school for boys, **3139.**
**Charter Oak,** historic tree at Hartford, Conn., blown down in 1856, **868, 1595, 3533,** *picture,* **867.**
**Charter of Liberties,** of Henry I, **1633.**
**Charters,** of corporations, **893;** of municipalities, **2370.**
**Charter's Towers,** Australia. Gold-mining town in Queensland, 60 mi. s.w. of Townsville on n.e. coast; pop. 17,000.
**Chartism.** Radical movement in England, culminating between 1840 and 1848; sought reform in parliamentary representation and universal adult male suffrage.
**Chartres** (*shärtr*), France. Mfg. city 45 mi. s.w. of Paris; pop. 24,000; famous cathedral; occupied by Germans 1870.
**Chartreuse** (*shär-trûz'*), **La Grande,** original mother-house of Carthusian monks, **2299.**
**Charybdis** (*kà-rĭb'dĭs*), in Gk. myth., whirlpool in Straits of Messina, **2563, 3230.**
**Chase, Salmon P.** (1808–73), Amer. statesman, b. Cornish, N.H.; leading Free-Soiler, early known as "attorney general of fugitive slaves," later a great sec. of the treasury (under Lincoln); as U.S. chief justice (1864–73) presided at impeachment trial of Pres. Johnson; in Lincoln cabinet, *picture,* **2015.**
**Chase, Samuel** (1741–1811). Amer. jurist, b. Somerset County, Md.; signer of Declaration of Independence; associate justice of U.S. Supreme Court; impeached by national House of Representatives for partisanship but not convicted; case important in history of Amer. judiciary.
**Chase, William Merritt** (1849–1916), Amer. landscape, portrait, genre,

and still-life painter, b. Franklin, Ind. ('Alice'; 'Flying Clouds'); especially successful teacher; **2634.**

**Chassis** (*chăs'is*), automobile, **279.**

**Chat, yellow-breasted, 3669.**

**Château, 657, 1350.**

**Châteaubriand** (*shȧ-tō-brē-äṅ'*), **François René, Vicomte de** (1768–1848), Fr. author and politician; exquisite prose stylist, one of first romanticists ('René'; 'Atala'; 'The Genius of Christianity'); **515.**

**Château d'If, 2154.**

**Châteaudun** (*shä-tō-dŭṅ'*), France. Town on Loire R. 70 mi. s.w. of Paris; old castle of counts of Dunois; burned by Germans in 1870.

**Château Gaillard** (*gā-yär'*), famous castle 50 mi. n.w. of Paris on Seine R., now in ruins, **3016.**

**Château-Thierry** (*sha-tō'-tyĕ-rē'*), Fr. town 47 mi. e. of Paris; pop. 12,000; scene of famous battle of World War, **699–700, 3805–6,** *picture,* **3801.**

**Chatham** (*chăt'ăm*). **William Pitt,** first **Earl of** (1708–78), Brit. statesman, **700, 1428;** and Amer. colonies, **3002, 3338;** Fr. and Indian War, **1362, 3775;** Seven Years' War, **3180.**

**Chatham,** England. Seaport 25 mi. s.e. of London on Medbury R., adjoining Rochester; pop. 40,000; naval arsenal; shipbuilding.

**Chatham,** New Brunswick. Port on Miramichi R. 35 mi. above Gulf of St. Lawrence; pop. 4500.

**Chatham,** Ontario. Farming (sugar beets), fruit-growing, and mfg. center, on Thames R. 45 mi. e. of Detroit; pop. 12,500; canned goods, automobiles, machinery, packed meat; natural gas.

**Chatham Islands,** group belonging to New Zealand, 536 mi. e.; 375 sq. mi.; pop. 500; sheep grazing; **2500.**

**Chatillon-sur-Seine** (*shä-tē-yôṅ'sür sān*), France. (Town 125 mi. s.e. of Paris on Seine R.; unsuccessful congress of Napoleon with Allies (1814).

**Chattahoo'chee River,** in Ala. and Ga.; 500 mi.; unites with Flint to form Apalachicola; **72.**

**Chattanoo'ga,** Tenn., r.r. and industrial city in s.e. on Tennessee R.; pop. 57,895; important cotton, grain, coal, lumber, and iron market, with steel, iron, and textile mills; Univ. of Chattanooga; **701, 3465, 3466.**

**Chattanooga, battle of** (Nov. 24–25, 1863), **700–1, 1498.**

**Chattanooga, University of.** Meth. Episc. co-ed. institution at Chattanooga, Tenn.; founded 1867; arts, science, law, medicine.

**Chattel,** origin of word, **663.**

**Chat'terton, Thomas** (1752–70). Eng. poet and literary forger, precocious genius; wrote 'Rowley Poems', which he claimed were old manuscripts of 15th cent.; starving in a London garret, poisoned himself.

**Chaucer** (*chą'sẽr*), **Geoffrey** (1340?–1400), early Eng. poet, **701–7, 1163;** description of squire, quoted, **1934;** influence on Eng. language, **1162, 702;** stories from 'Canterbury Tales', **704–7;** tomb, **3719.**

**Chaudiere** (*shō-dyêr'*) **Falls,** of Ottawa R., **2604.**

**Chaulmoo'gra oil.** Fixed oil obtained from fruit of chaulmoogra tree of E. Indies; used in treatment of leprosy.

**Chaumont** (*shō-môṅ'*), France. Mfg. town 110 mi. s.w. of Paris; pop. 15,000; treaty of Allies against Napoleon 1814; general headquarters A.E.F. in World War.

**Chauncey, Isaac** (1772–1840), Amer. commodore, **2730.**

**Chautauqua** (*shą-tą'kwȧ*), N.Y. Village on L. Chautauqua, 60 mi. s.w. of Buffalo; pop. 3533; center of popular educational movement (the Chautauqua) founded 1874.

**Chautauqua,** a lake in w. N.Y., 8 mi. from L. Erie; 18 mi. long; **2482.**

**Chautauqua** (Literary and Scientific Circle), **707, 3140.**

**Chau'vinism.** Term used to denote exaggerated patriotism or "jingoism"; derived from name of a Fr. soldier of the Revolution and First Empire, Nicholas Chauvin, who was passionately devoted to Napoleon.

**Chaux-de-Fonds** (*shō-dē-fôṅ'*), **La,** Switzerland. Town 30 mi. n.w. of Bern in Jura valley; pop. 38,000; watch and clock making.

**Check,** in banking, **327.**

**Checkerberry,** or wintergreen, **3752.**

**Checkers,** or draughts, a game, **707–8.**

**Checkmate,** in chess, **716, 718.**

**Ched'dar,** England, village in Somersetshire; gives name to Cheddar cheese; cave, *picture,* **664.**

**Cheddar cheese, 709.**

**Cheeryble** (*chĕr'ĭ-bl*) **Brothers.** In Dickens' 'Nicholas Nickleby', kind-hearted twins, London merchants.

**Cheese, 708–9, 952;** bacteria, **302, 709;** food value, **709, 2926, 1320, 1321.** *See also in Index* **Dairying.**

**Chee'tah** or **chetah,** "hunting leopard" of Asia, **1989.**

**Chefoo** (*chē-fų'*) or **Chifu,** China, port on n. coast of Shantung; pop. 55,000; **3196.**

**Chekhof** (*chĕ'kŏf*), **Anton Pavlovitch** (1860–1904), Rus. dramatist and short-story writer, powerful realist, **3097;** chief works, **3098.**

**Chekiang** (*chē-ki-äng'*). Fertile maritime province of China on Pacific; 36,670 sq. mi.; pop. 14,000,000; cap. Hangchow; silk, tea, cotton, fruit.

**Chelae** (*kē'lē*) or **chelipeds,** grasping claws or "pincers" of crustaceans, **3946,** *picture,* **915.**

**Chelicera** (*kē-lis'ĕ-rȧ*), claw-like fang of spider, **3326,** *picture,* **3323.**

**Chelo'nia,** turtle sub-class of reptiles, **2997, 3949,** turtles, **3562–8;** tortoises, **3520.**

**Chelsea** (*chĕl'sĭ*), dist. of London, **2056, 2883.**

**Chelsea,** Mass., city 3 mi. n.e. of Boston; pop. 43,184; rubber goods, machine-shop products, leather, cordage, brass goods, pottery, paste; **472.**

**Chel'tenham,** England. Watering place 90 mi. n.w. of London on Chelt R.; pop. 48,000; mineral springs; educational center.

**Chelyuskin** (*chĕl-yų̆s'kĭn*), **Cape,** n. Siberia, **226.**

**Chemical affinity, 712, 714.**

**Chemical analysis, 715.**

**Chemical compound, 711–2.**

**Chemical elements,** tables, **715, 4042.**

**Chemical formulas, 715–6, 4040.**

**Chemical warfare, 1408, 217.**

**Chemical Warfare Service,** of U.S. Army, **3599, 217.**

**Chemin des Dames** (*shĕ-măṅ' dā dām*) ("Ladies' Road"). Fr. road running from point near Soissons along ridge between Aisne R. and Ailette R. to Reims; objective of repeated "battles of the Aisne."

**Chemistry** (*kĕm'ĭs-trĭ*), **710–16,** *Study Outline,* **4038–4044;** acids, **8, 10, 2201,** in agriculture, **46, 47, 3273;** alkalies, **8, 10;** allotropes, **2612, 2777, 3389;** alloys, **99;** atomic weights, **4039, 4042;** atoms, **1112, 256, 1117, 714–5;** bases, **8, 10, 2201;** biochemistry, **3935;** catalytic action, **2831;** coal tar derivatives, **814, 816;** combustion, **1249–50, 2611–2;** crystals and crystallization, **935;** cyanides, **944;** of digestion, **1010, 1011;** dyes, **1049–50, 814;** electrical nature of chemical action, **256, 1121;** electrolysis, **1125, 1114;** electron theory of matter, **256, 1112;** elements (tables), **715, 4042;** enzymes, **1172–3, 1010–1;** explosives, **1211–2, 2511, 712;** fats and oils, **1225–7;** fertilizers, **1235;** food, **1320, 1225–7, 2926;** formulas, **715–6, 4040;** halogens, **755, 1802;** of human body, **2792, 1172–3, 1010, 1011, 2998–9;** metals, **2201, 2247, 1710;** minerals, **2247–8;** nitrogen, fixation of, **2512, 1235;** organic, **714, 384, 4043;** of plant life, **2824, 2828, 1235;** proteins, **2926, 1320;** radio activity, **2959–61;** salts, **8, 10, 3115, 3116;** spectroscope and spectrum analysis, **3311–4, 240;** "synthetic plastics," **673, 814, 816;** X-ray spectrums, **3826.** —*History:* alchemy the forerunner, **710;** Arab contributions, **2278;** atom defined by Boyle, **1117;** Davy, **969;** Faraday, **1224;** Lavoisier proves "oxidation theory" of combustion, **1249, 2612;** rise of modern industrial chemistry, **10;** radium upsets old theories, **2959.** *See also in Index* the elements, important compounds, and chief topics above by name.

**Chemnitz** (*kĕm'nĭts*), Germany, mfg. and commercial city 38 mi. s.w. of Dresden; pop. 304,000; textiles, gloves, locomotives, machinery, leather, chemicals; **1444, 3132.**

**Chemot'ropism, 2828.**

**Chengtu** (*chĕng-tų'*). City in w. China on Min R.; pop. 400,000; agricultural and mining center.

**Chénier** (*shā-nyā'*), **André de** (1762–94). Fr. poet, one of greatest of 18th cent.; guillotined during Reign of Terror for his opposition to the excesses of the Convention.

**Chenille** (*shĕ-nēl'*) **carpets, 3080.**

**Chenonceaux** (*shĕ-nôṅ-sō'*), **Château of,** *picture,* **1342.**

**Cheops** (*kē'ŏps*). *See in Index* **Khufu.**

**Chephren** (*kĕf'rĕn*). *See in Index* **Khafre.**

**Cherbourg** (*shĕr-bųr'*), France, port on English Channel; pop. 44,000; strongly fortified arsenal; **1344, 2513.**

**Cherimoy'er,** or "custard apple," **1378.**

**Cherokees',** Indian tribe of s.e. U.S.; originally lived in mountain region of Va., the Carolinas, Ga., Ala., and Tenn.; **1766, 1434, 3468;** moved to Indian Territory, **2576.**

**Cherra Punji** (*chĕ'rä pŭn'jē*), India, village of Assam, in Khasi Hills; rainfall, **2972.**

**Cher** (*shêr*) **River,** in cent. France, tributary to Loire, 200 mi. long, *picture,* **1342.**

**Cherry, 716, 1379, 1380;** "black," poisonous, **2854;** classified, **3533;** origin, **232;** pits, **944, 3173.**

**Cherry Creek,** Colo., **998.**

**Cherry laurel,** *picture,* **2853.**

**Cherry Valley,** N.Y. Village 52 mi. w. of Albany; massacre during Rev. War (Nov., 1778) by Indians under Joseph Brant, aided by Tories and English.

**Chersonesus** (*kẽr-sō-nē'sŭs*). Gk. word for peninsula, applied especially to Thracian Chersonesus (modern Gallipoli), Tauric Chersonesus (Crimea), and Cimbrian Chersonesus (Jutland).

**Cherubini** (*kā-rų-bē'nē*), **Maria Luigi C. Z. S.** (1760–1842). Ital. composer and author; "link between classic idealism and modern romanticism" ('Requiem in C Minor'; work on counterpoint still a standard).

**'Chesapeake',** famous U.S. frigate, **3670, 1973, 3672.**

**Chesapeake and Ohio Canal, 626.**

**Chesapeake Bay,** inlet on Atlantic coast of U.S., **716, 2160;** canvasback duck, **1045;** origin, **2788;** oyster fisheries, **2612.**

**Cheshire** (*chĕsh'ẽr*) or **Chester.** A n.w. county of England bordering on n. Wales and Irish Sea; 1028 sq. mi.; pop. 1,055,000; mfg., salt-mining; county seat Chester.

**Cheshire cheese, 709.**

**Cheshire Cheese,** famous tavern in London, **1899, 2052.**

**Chess** (game), **716–8.**

**Chester,** England, picturesque old city 16 mi. s.e. of Liverpool on Dee R.; pop. 43,000; mfg. and r.r. center; cheese market; **1158,** *picture,* **1157.**
**Chester,** Pa. City on Delaware R. 14 mi. from Philadelphia; pop. 58,030; print works, machine shops, locomotives, textiles; important shipbuilding center during World War; oldest city in state.
**Ches'terfield, Philip Dormer Stanhope, 4th Earl of** (1694–1733). Eng. statesman, author, and patron of literature; name used as a synonym for courtly manners; letters to his son full of cynical wordly wisdom.
**Ches'terton, Gilbert Keith** (born 1874) Eng. novelist, critic, and brilliant satirist, addicted to pungent paradox ('The Man Who Was Friday'; 'Heretics'; 'Orthodoxy').
**Chester White,** a breed of hogs, **1671,** *picture,* **1670.**
**Chestnut, 718–9, 2545;** blight, **866;** burs, **3173;** classified, **3533;** chinquapins, **752;** as food, **894;** largest, **1185;** structure of nut, **3538,** *picture,* **2545.**
**Chestnut oak, 2547, 2548.**
**Cheviot** (*chĕv'ĭ-ŏt*), a breed of sheep, **3200.**
**Cheviot Hills,** range 35 mi. long, forming part of Eng.-Scottish boundary; famous for sheep; **1150, 3146.**
**Chevreul** (*shē-vrûl'*). **Michel Eugène** (1786–1889), Fr. chemist, **3263.**
**Chevrons** (*shĕv'rŏns*), U.S. Army, **3576.**
**'Chev'y Chase'.** Famous Eng. ballad celebrating battle of Otterburn (1388) in which Scotch defeated English.
**Chewing gum, 719.**
**Chewink',** a type of finch, **1241.**
**Cheyenne** (*shī-ĕn'*), Wyo., cap. and important cattle-shipping point in s.e. of state; pop. 13,829; large meat-packing plants, creameries, r.r. shops; **3820, 3822;** capitol, *picture,* **3821.**
**Cheyenne River,** in Wyo., and S.D.; 500 mi. to the Missouri; *map,* **3296.**
**Cheyennes,** tribe of Plains Indians originally living along Cheyenne R., **1767, 528, 844;** moved to Indian Territory, **2576.**
**Chiapas** (*chē-ä'päs*), Mexico. State in s. on Isthmus of Tehuantepec, on Pacific; 27,527 sq. mi.; pop. 457,000; cap., Tuxtla Gutiérrez.
**Chiaramonti** (*kyä-rà-mōn'tē*) **museum, 3055.**
**Chiari** (*kē-ä'rē*), Italy. City 36 mi. e. of Milan; Austrians under Prince Eugene defeated Fr. and Span. troops 1701.
**Chicago,** Ill., 2d largest city in U.S.; pop. 2,701,705; **720–8;** board of trade, **3732, 440;** fire of 1871, **1262, 725;** foreign pop., **722, 948;** Ft. Dearborn burned, **725, 3672;** Haymarket Riot and Pullman strike, **791;** Hull House, **17;** juvenile court, **1906;** manufactures, **720, 721, 1733;** r.r. center, **721, 723, 2971;** shipping, **721, 723, 1512, 1514, 1733;** first skyscraper, **529;** stockyards and packing plants, **2180–1, 1733;** story, 'Lost in Chicago', **726–8;** water supply, **723, 3701, 3702.**
**Chicago, University of,** at Chicago, Ill.; opened 1892 (chartered 1890); co-ed., non-sect.; divinity, science, education, law, medicine, arts, literature, commerce and administration; **831, 1086, 1736;** library, *picture,* **1734;** Yerkes Observatory, **2552,** *picture,* **2551.**
**Chicago & North Western Railway, 3296.**
**Chicago Drainage Canal, 723–4, 627, 1733–4;** effect on lakes, **1514, 2227.**
**Chicago Heights,** Ill. Mfg. and residential suburb of Chicago, 23 mi. s.; pop. 19,653; iron and steel, lace, chemicals.
**Chicago, Milwaukee & St. Paul Railroad, 2963, 2968, 1125.**
**Chicago River, 721, 724, 627.**
**Chichen-Itza** (*chē-chän'-ē-tzä'*), Mexico, village in Yucatan; extensive Maya ruins; palace, *picture,* **289.**
**Chichester** (*chĭch'ĕs-tẽr*), England. Town 14 mi. n.e. of Portsmouth; 12th cent. cathedral, noted for double aisles and detached campanile; one time cap. of kingdom of Sussex.
**Chichopoxtle,** Mexican fruit, **2213.**
**Chick'adee, 728,** pictures, **420, 2408, 2411;** belongs to titmouse family, **3505.**
**Chickahom'iny River,** in s.e. Va., flows 75 mi. to James R.; Smith's exploration, **3253;** Seven Days' battles in Civil War, **2095, 778.**
**Chickamauga** (*chĭk-à-mą'gà*), small r. 7 mi. e. of Chattanooga, Tenn.; Confederate victory under Bragg (Sept. 1863), **3490, 700.**
**Chick'asaw Bluffs.** On Yazoo R., n. of Vicksburg, Miss.; Confederates repulsed Federals under Sherman (Dec. 1862).
**Chickasaws,** Indian tribe of s.e. U.S. formerly living in n. Miss. and w. Tenn., **1766, 2198;** later moved to w. Okla., **2576.**
**Chick'asha,** Okla. Commercial center of stock-raising and cotton-growing region, 40 mi. s.w. of Oklahoma City; pop. 10,179; r.r. shops, cottonseed-oil mills; Oklahoma College for Women.
**Chicken pox.** Highly contagious disease, chiefly of children; characterized by skin eruptions and fever; no relation to smallpox and seldom dangerous.
**Chickens.** *See in Index* **Poultry.**
**Chicken snake, 3260.**
**Chick-pea, 2698.**
**Chicle,** source of chewing gum, **719;** from naseberry tree, **1552;** from sapodilla tree, **1378.**
**Chico** (*chē'kō*), Calif. Fruit and live stock center 80 mi. n. of Sacramento; pop. 9339; lumber mfrs.; large natural park; normal school.
**Chic'opee,** Mass. Mfg. city 3 mi. n. of Springfield, on Connecticut R.; pop. 36,214; variety of mfrs.; settled about 1675.
**Chic'ory,** plant of the aster family; related to dandelion, **957;** root used as coffee adulterant, **823, 824.**
**Chicoutimi** (*shē-kụ-tē-mē'*), Quebec. Resort on Saguenay R., 110 mi. n. of Quebec city; pop. 7000; large pulp and lumber mills, tanneries.
**Chief justice,** of the United States, **909;** office held by John Jay 1789–94; John Rutledge 1795–96; Oliver Ellsworth 1796–99; John Marshall 1801–35; Roger B. Taney 1836–64; Salmon P. Chase 1864–73; Morrison R. Waite 1874–88; Melville W. Fuller 1888–1910; Edward D. White 1910–21; William H. Taft, appointed 1921.
**Chiemsee** (*ĸēm'zā*), largest lake of Bavaria, Germany, 42 mi. s.e. of Munich; 8½ by 6 mi.; **1442.**
**Chifu,** China. Same as **Chefoo.**
**Chig'ger** or **chig'oe,** a skin parasite, *picture,* **2678.**
**Chihli** (*chē'lē*), n.e. province of China proper; 116,000 sq. mi.; much of it lies beyond Great Wall; cap. Tientsin, **3498.**
**Chihuahua** (*chē-wä'wä*), Mexico. State in n. bordering on Texas; 90,036 sq. mi.; pop. 424,000; cap., Chihuahua.
**Chihuahua,** Mexico. City 225 mi. s. of El Paso, Tex., in silver-mining and stock-raising dist.; pop. 40,000; makes textiles.
**Chilblains.** An inflammation of the feet (sometimes of the hands or other parts of body) caused by exposure to extreme cold or by rapid changes in temperature; accompanied by painful swelling, burning, and itching.
**Child, Lydia Maria** (1802–80). Amer. author and abolitionist, b. Medford, Mass.; published first monthly for children in U.S.
**Child, care of, 291–4;** diet, **1320–2, 2238–9, 3651–2;** heredity, **1641–4;** hygiene, **1713–6;** care of teeth, **3454.**
**'Childe Harold's Pilgrimage',** poem by Byron, **551.**
**Child labor, 1218,** Children's Bureau (U.S.), **3600;** in China, **751–2;** Japan, **1867;** laws, **728–9, 1218;** vocational education, **3655–6.**
**Children,** in Arabia, **167–8;** Aztec, **289;** in China, **749–52;** Eskimo, **1175–7;** Indian, **204–7, 1775–6;** in Japan, **1870–2;** of *Mayflower* Pilgrims, **2844;** in anc. Sparta, **3308–9.**
**Children, literature for, 2027–30, 3367, 2979–82, 2340.**
**'Children of the Desert',** story, **167–8.**
**'Children of the Pilgrims',** story, **2844–6.**
**Children's Bureau** (U.S.), **3600.**
**Children's Crusade, 932.**
**Children's organizations:** Boy Scouts, **478–86;** Camp Fire Girls, **592–4;** George Junior Republic, **1430;** Girl Scouts, **1464–5;** Junior Red Cross, **2984, 2986;** Sunday schools, **3395–6.**
**Child training, 729–35;** adolescence, **25–6;** ambition, **107–8;** chivalry, **753–4;** courage, **907–8;** emotions, **1144;** folk-dances, **1316–9;** friendship, **1371;** games, **2833–8;** good manners, **1182–5;** habits, **1557;** honesty, **1677;** honor of the playing field, **253;** humility, **1697;** imagination, **1737;** intelligence, testing, **1793;** keeping our word, **1915;** kindergarten, **1923–5;** literature for children, **2027–30;** memory training, **2197;** Montessori method, **2313–6;** nature study, **2406–17;** obedience, **2550;** optimism, **2586–7;** patriotism, **2696–7;** purity, **2938;** reading, **2979–82;** slander, **3247;** story-telling, **3367;** how to study, **3372–4;** value of time, **3503.** *See also in Index* **Education; Schools.**
**Child welfare:** Children's Bureau (U.S.), **3600;** juvenile courts, **1906;** mothers' pensions, **2722;** playgrounds, **2832;** reform schools, **2920;** social settlements, **17, 3269;** work of women's clubs, **3777.**
**Chile** (*chē'lā*), republic on w. coast of S. Amer.; 290,000 sq. mi.; pop. 4,000,000; cap. Santiago; **735–8,** *maps,* **191, 3288–9;** agriculture, **736, 738;** chief cities, **3125, 3615;** climate and rainfall, **735, 736, 122, 2973,** *map,* **3288–9;** Easter Isl., **1070;** history and govt., **738, 192, 2744, 1593;** minerals, **736, 3289;** mountains, **122–3;** nitrates, **736, 1235, 3286;** Patagonia, **2692;** population, **735, 738, 2692,** *map,* **3288;** surface features, **735–6, 3284, 3286,** *map,* **3288;** vegetation, *map,* **3288.**
**Chile saltpeter, 3118, 2510.**
**Chil'koot Pass,** in s.e. Alaska 60 mi. n.w. of Juneau, used by gold-seekers in rush of 1896–98; superseded by r.r. through White Pass; **76.**
**Chillan** (*chēl-yän'*). City in cent. Chile 50 mi. n.e. of Concepcion; pop. 40,000; sulphur baths; founded 1579; rebuilt 1835 after earthquake.
**Chil'li** or **red pepper, 2723.**
**Chillicoth'e,** Ohio, center of agricultural and coal-mining region 44 mi. s. of Columbus, on Scioto R.; pop. 15,831; large cannery, pulp and paper mills, etc.; formerly state capital, **849.**
**Chillon** (*shē-yôn'*), **Castle of, 1412.**
**Chills,** treatment of, **1269.**
**Chilon** (*kī'lŏn*), Gk. sage, **3275.**
**Chilop'oda,** a class of many-legged arthropods, **3946;** centipedes, **679.**
**Chil'tern Hills.** A range of low chalk hills 40 mi. n.w. of London; once densely forested.
**Chiltern Hundreds.** Three districts in Buckinghamshire whose stew-

ardship is a nominal Crown office. As the acceptance of a Crown office disqualifies a member of Parliament (who by law may not resign his seat), the stewardship of Chiltern Hundreds has become an avenue of escape for members who wish to quit office.

**Chimborazo** (*chĭm-bō-rä'zō*), volcanic mountain in Ecuador 100 mi. s. of Quito; 20,500 ft.; one of highest peaks in Andes; **123, 1078.**

**Chimera** (*kī-mē'rà*), in Gk. myth., fire-breathing monster, **2706.**

**Chimes,** how rung, **378.**

**Chimneys,** first use of, **3368.**

**Chimney swift,** **3399,** *picture,* **416.**

**Chimpan'zee,** an African ape, **738–9, 34;** foot, *picture,* **1323;** hand, *picture,* **153;** resemblances to man, **153, 154.**

**China,** country on e. coast of Asia; 4,277,000 sq. mi.; pop. 362,000,000; **739–49,** *maps,* **740, 232–3;** story, 'Wung Foo's Busy Day', **749–52;** *Study Outline,* **3922.**

Art, **744, 1140, 1145–6, 1168, 1954, 2881–3;** average income, **233;** child life, **749–52;** costume, **749–50,** *pictures,* **744, 750;** education, **639, 2708,** *pictures,* **746, 3139;** emigration, **639** (*see also* under **Chinese**); etiquette, **742;** festivals, **751, 742, 2478, 2479, 1931, 3234;** flag, **749;** foot-binding, **742;** foreign interests in, **748, 3195–6, 1678–9, 232;** ginseng in medicine, **1460–1;** Great Wall, **744–5,** *map,* **740,** *picture,* **741;** kite-flying, **1931, 742;** language, **744, 2771, 2772;** opium, **2585;** piracy, **2810;** population, **740, 742, 749, 230, 2286,** *map,* **232–3;** religions, **744, 2993–4, 525, 639,** *picture,* **638;** Rockefeller Medical Commission, **3034;** river-dwellers, **230, 751, 639, 1679,** *picture,* **229;** transportation, **749, 3827, 638,** *pictures,* **638, 3525;** treaty ports, **746;** wells, **3702;** writing, **744, 1871, 3816.**

*Geography and industries:* agriculture, **744, 230;** bamboo, **323–4;** chief cities, **638–9, 1319–20, 1574–5, 1678–9, 2389, 2707–8, 3195, 3498;** climate, **740;** deserts, **228;** fisheries, **749, 751, 1286;** foreign commerce, **744, 746, 639, 1320, 1678, 2708, 3195, 3496, 3498;** lacquer, **1954;** loess soil, **3273, 3750;** manufactures, **1575, 1679, 1954, 2389, 2903, 3079, 3195, 3498;** minerals, **744, 814, 1575, 1868, 3195;** pearl industry, **2703;** rainfall, *map,* **232–3;** rice, **3013, 3015;** rivers and canals, **740, 749, 230, 1706, 3827, 625;** silk industry, **3234–5, 2365, 2366, 2389, 3195, 3196;** surface features, **739–40, 1706,** *map,* **232–3;** tea, **3445–51;** vegetation, *map,* **232–3.**

*History and government,* **745–6, 748, 749;** early civilization, **232, 3730, 1780, 1552;** Confucius, **858;** conquered by Mongols, **2285;** Marco Polo's visit, **2874;** Manchu dynasty founded, **2134;** Opium War, **2585, 1679;** Treaty Ports opened, **746, 3498;** Taiping rebellion, **749, 1489;** war with Japan, **1869–70;** German acquisitions, **3195;** "open door" policy, **3606;** Russian and Japanese occupation, **3098;** Revolution of 1912, **2389;** woman suffrage adopted, **3779;** relations with U.S., **748, 1611, 3746;** World War and Shantung question, **3796, 3812, 3195, 1870.** *See also in Index* **Manchuria; Mongolia; Shantung; Tibet; Turkestan;** and names of chief rivers and cities.

**China aster,** **237.**

**China clay,** or kaolin, **785, 2668.**

**China grass,** **1407, 2667.**

**China pink,** flower, **2809.**

**China rose,** *picture,* **3067.**

**China Sea,** **2619,** *map,* **232–3.**

**China silk,** **3235.**

**Chinatown,** San Francisco, **3124.**

**Chinaware.** *See in Index* **Porcelain and chinaware.**

**China wood-oil,** **1227.**

**Chinch bug,** **752, 3730.**

**Chinchilla** (*chĭn-chĭl'là*), small fur-bearing rodent of Peru and Chile, **752.**

**Chinchilla cat,** *picture,* **659.**

**Chinchilla fur,** **1390;** imitated, **1389.**

**Chinese,** in Bornco, **468;** Brit. Columbia, **3639;** Calif., **582, 3124;** Malay Peninsula, **2130;** Philippines, **2766–7;** Siam, **3227;** Singapore, **3243.**

**Chinese Exclusion Act,** **223, 1611.**

**"Chinese Gordon,"** **1489.**

**Chinese language,** **744, 2771, 2772, 3816.**

**Chinese terrier,** *picture,* **1021.**

**Chinese Turkestan,** **3555, 228, 740.**

**Chinese wall,** **744–5,** *map,* **740,** *picture,* **741.**

**Chingachgook** (*chĭn-gäch'gŭk*), Indian chief of James Fenimore Cooper's tales 'Last of the Mohicans', 'Pathfinder', 'Deerslayer', and 'Pioneer'; **878.**

**Chingtu,** China. Same as **Chengtu.**

**Chinkiang** (*chĭn-kē-äng'*), China, treaty port on Yangtze R. 150 mi. from mouth; pop. 170,000; **3827.**

**Chinook** (*chĭ-nŏk'*), tribe of Indians of n. Pacific area; formerly living about mouth of Columbia R., and along its banks; **1767.**

**Chinook fire,** how to make, **598.**

**Chinook salmon,** **3113.**

**Chinook winds,** warm dry winds which descend from e. slopes of Rocky Mts., in n. U.S. and Canada, bringing great relief in cold weather, **3751;** effect in Alberta, **82;** in Brit. Columbia, **512;** in Peace R. valley, **2698–9.**

**Chinquapin** (*chĭng'kà-pĭn*), nut of dwarf type of chestnut, **752, 2545, 2547;** water-lily seeds, **3699.**

**Chins,** tribe of Upper Burma, **541.**

**Chintz** (Hindu "spotted"). Printed cotton fabric, usually with varicolored patterns, and with highly calendered surface.

**Chinwangtao** (*chēng-wäng-tou'*), seaport of n. China; pop. 5000; **3498.**

**Chioggia** (*kē-ŏj'ä*), Italy, seaport 18 mi. s. of Venice, on an isl. at s. end of Venetian lagoon; pop. 36,000; Venetians defeat Genoese (1380), **1412.**

**Chios** (*kī'ŏs*), fertile isl. in Aegean Sea w. of Smyrna, modern Scio; 320 sq. mi.; pop. 74,000; reputed birthplace of Homer; ceded to Greece by Turkey 1913; anc. Gk. colony, **1520.**

**Chipilly** (*shē-pē-yē'*), France. Village and nearby ridge of same name on Somme R., 15 mi. e. of Amiens; captured by Americans Aug. 9, 1918.

**Chip'munk,** or ground squirrel, **752;** hibernation, **1646.**

**Chip'pendale, Thomas** (d. 1779), famous Eng. cabinetmaker; best work produced 1735–60; "marvelous for beauty of proportion, comfort in use, strength, and durability"; **1384.**

**Chippewa** (*chĭp'ĕ-wą*), village in Ontario, Canada, 2 mi. above Niagara Falls; Americans defeated English 1814; Gen. Scott, **3153.**

**Chippewa Indians.** Same as **Ojibwas.**

**Chippewa** (originally Ojibwa) **River,** of Wis.; rises in n. and flows s.w. to Mississippi R.; **2266, 1055.**

**Chippy** or **chipping sparrow,** **3308.**

**Chiron** (*kī'rŏn*), in Gk. myth., famous centaur noted for his learning and wisdom, **678–9;** tutor of Achilles, **8,** of Hercules, **1640.**

**Chiropractics** (*kī-rō-prăk'tĭks*), defined, **2193.**

**Chiroptera** (*kī-rŏp'tĕr-à*), the bat order, **2132, 346.**

**Chisanau.** Same as **Kishinev.**

**Chishima** (*chē'shē-mä*) **Islands.** Same as **Kuril Islands.**

**Chita** (*chē'tä*), Siberia, city about 150 mi. n. of Mongolian border and 370 mi e. of Irkutsk; on Trans-Siberian R.R.; pop. 79,200; cap. Far Eastern Republic, **3229.**

**Chitin** (*kī'tĭn*), stiffening material in skins of arthropods, **3945;** in insects, **1784;** overlaid with lime in crustaceans, **915.**

**Chiton** (*kī'tŏn*), Gk. garment, **897.**

**Chiton,** mollusk with a "coat-of-mail" shell, **2281, 3201,** *picture,* **3203.**

**Chiv'alry,** the knightly class of feudal times, and hence also the qualities of the ideal knight—gallantry, a high sense of honor, and courtesy, **753–4;** spirit expressed in romances, **3039;** burlesqued by Cervantes, **683–4.** *See also in Index* **Knighthood and Chivalry.**

**'Chivalry',** a Little Talk by Arthur Mee, **753–4.**

**Chive** (*chīv*), plant allied to onion, **2581.**

**Chlamys** (*klă'mĭs*), Gk. garment, **897.**

**Chlo'ral,** a drug, **1042.**

**Chlo'rate,** salt containing a metal with chlorine and oxygen; of potassium, **2170.**

**Chloride,** a compound of chlorine with an element, **1710, 755;** of ammonia, **118;** ammonium, **118, 3272;** calcium, **1362;** cobalt, **1779, 810;** gold, **1482;** lime (bleaching powder), **435, 755;** potassium, **1235;** silver, in photography, **3242;** sodium (common salt), **3272;** zinc, **3839.**

**Chlorina'tion process,** **1480.**

**Chlorine** (*klō'rĭn*), gaseous chemical element, **755, 4042;** bleaching properties, **435;** poison, **2855;** in protoplasm, **394;** purifies water, **3704;** separates gold from ore, **1480;** used in gas warfare, **1408.** *See also* **Chlorate; Chloride.**

**Chlo'roform,** an anesthetic, **124, 125, 755.**

**Chlorophyll** (*klō'rō-fĭl*), green coloring matter of plants, **2824, 2823, 1980;** in algae, **92;** the basic "food maker" for all life, **394, 52, 3936;** withdrawal in autumn, **1982.**

**Choate** (*chōt*), **Joseph Hodges** (1832–1917). Amer. lawyer and diplomat, b. Salem, Mass.; called leading advocate of Amer. bar; ambassador to Gt. Brit. (1899–1905); delegate (1907) to Hague International Peace Conference.

**Choate, Rufus** (1799–1859). Amer. lawyer, b. Ipswich, Mass.; famous orator and leader of New England bar.

**Choc'olate,** **755–6;** cacao bean, **562, 3173;** in candy-making, **630;** production in Pa., **2720.**

**Choctaws** (*chŏk'tąz*), Indian tribe of s.e. U.S., formerly lived in s. Miss. and Ala., **1766, 2576.**

**Choir** (*kwīr*), in architecture, part of church occupied by singers; *diagram,* **186.**

**Choke-boring** of shotguns, **1257.**

**Choke damp,** miner's term for carbon dioxide, **642.**

**Choking,** first aid for, **1269.**

**Cholera** (*kŏl'ĕr-à*), dangerous epidemic disease; caused by bacteria, **1450,** *picture,* **1452;** former prevalence, **1615;** "hog," **1671;** serum treatment, **151–2.**

**Cholon** (*shō-lôn'*) ("great market"), largest commercial center of Cochin-China; pop. 191,000; rice mills; **1777.**

**Cholos** (*chō'lōs*), people of mixed white and Indian blood; in Bolivia, **450.**

**Chopin** (*shō-păn'*), **Frédéric François** (1810–49), Polish pianist and composer, **757;** and Liszt, **2026.**

**Chop-suey,** a Chinese dish, **751, 323–4.**

**Chord** (*kôrd*), in music, **2378.**

**Chorda'ta,** all animals, including vertebrates, with spinal cords, **130,** *Study Outlines,* **3947–52.**

**Choroid** (*kō'roid*), middle layer of the eyeball, **1213,** *picture,* **1214.**

**Chorus,** in Gk. drama, **1031–2.**

**Chosen** (*chō-sŭn'*), official Japanese name for Korea, **1942–4.**

**Chosroes I** (*kŏs'rō-ēz*), king of Persia 531–79 A.D.; sacks Antioch, **150.**
**Chosroes II,** ruler of Persia 590–628 A.D., **2738.**
**Chouteau** (*shọ-tō'*), **Auguste** (1739–1829) and **Pierre** (1749–1849), Amer. pioneers, founders of St. Louis, Mo.; in Neb., **2432.**
**Christ,** the Messiah, title of Jesus, **1887–8.**
**Christ, Order of** (papal), **979.**
**Chris'tabel.** The gentle pious heroine of Coleridge's fragmentary poem of that name.
**Christ Church,** Boston, **472,** *picture,* **471.**
**Christchurch,** England. Seaport on s. coast 30 mi. w. of Portsmouth on confluence of Avon and Stour rivers; great medieval church.
**Christchurch,** New Zealand, city on South Isl. 7 mi. from port Lyttelton on e. coast; pop. 102,000; trade in timber, mutton, wool; **2500.**
**Christ Church College,** Oxford, **2610, 3776,** *picture,* **2609;** great bell, **379.**
**Christian,** hero of Bunyan's 'Pilgrim's Progress', **535–8.**
**Christian II** (1481–1559), king of Denmark and Norway; conquered Sweden 1520; deposed; massacre of nobles, **3358.**
**Christian IV** (1577–1648), king of Denmark and Norway, **757, 758;** in Thirty Years' War, **3488;** statue, *picture,* **2535.**
**Christian V** (1646–99), king of Denmark and Norway; weak but despotic ruler; unsuccessful war against Sweden; statue, *picture,* **995.**
**Christian IX** (1818–1906), king of Denmark, **757.**
**Christian X** (born 1870), king of Denmark, **757.**
**Christiana Creek,** Del., **987.**
**Christian Endeavor Society, 757.**
**Christiania** (*krĭs-tĭ-ā'nĭ-ȧ*), cap. and chief seaport of Norway; pop. 260,000; **758;** winter sports, **2530;** statue of Christian IV, *picture,* **2535.**
**Christianity,** number of adherents, **2993, 2994;** Bible, **387–91;** chief divisions, **2994;** Copts, **1094, 1096;** Greek Cath. church, **3088, 3250;** influence on Mohammed, **2276;** origin of Sabbath, **3103;** Sunday schools, **3395–6.**
*History:* founded, **1887–8;** doctrines formulated by Paul, **2698;** spread by apostles, **157, 1888, 886;** early persecutions in Rome, **3052, 2156, 2436, 2147;** Constantine legalizes, **870;** Arian heresy, **763, 870, 3618, 1491;** spread by Roman Empire, **3047, 3048;** in n. Africa, **38, 3549;** in Brit. Isles, **1152, 636, 1808, 2694–5;** Iona an early center, **1625;** Gauls and Franks converted, **1352, 810,** Goths, **1491,** Armenians, **211–2,** Germans, **1447, 454;** spread by Charlemagne, **689, 3132;** introduced into Denmark, **997;** conversion of Northmen, **2526;** Prussia Christianized, **932, 2928;** Russia, **3089;** spread in Asia, **744, 1749, 3823, 1868, 1869, 1944;** in Pacific isls., **3120–1, 2624, 2766, 2767, 2770;** among Eskimos, **1174.** *See also in Index* **Church, Christian.**
**Christian Science, 1080, 758.**
**Christina** (*krĭs-tē'nȧ*) (1626–89). Queen of Sweden; brilliant erratic daughter of Gustavus Adolphus; succeeded 1632; abdicated 1654 in favor of her cousin Charles X.
**Christmas, 758–60, 3129;** holly, **1673;** mistletoe, **2274.**
**'Christmas Carol',** by Dickens, story retold, **760–2.**
**Christmas fern, 1234.**
**Christmas Island.** Name of two small isls., one in the Indian Ocean 190 mi. s. of Java, the other in the cent. Pacific near Fanning Isl.; both are Brit. possessions.
**Christmas rose,** or black hellebore, *picture,* **2852.**
**Christophe** (*krēs-tōf'*), **Henri** (1767–1820). King of Haiti; freed negro slave, rose to be lieutenant of Toussaint and Dessalines and life president; proclaimed king 1811; killed himself during rebellion provoked by his cruelties.
**Chris'topher III** (d. 1448), king of Denmark, Norway, and Sweden, **880.**
**Christopher, Saint** (3d cent.). Christian martyr; said to have been a giant who carried people across a stream; given the name Christophorus, "Christ Bearer," by the Christ Child whom he unwittingly carried across.
**Christ's Hospital,** school in London, **1958.**
**Chro'mate,** a salt containing chromium and oxygen; of lead (chrome yellow), **2642.**
**Chromat'ic aberra'tion, 1987–8, 2228;** in telescopes, **3462, 3463.**
**Chro'matin,** in cells, **394;** "carries" heredity, **1641–2,** *pictures,* **1643, 395.**
**Chrome** (*krōm*) **steel,** an alloy, **99.**
**Chrome tanning, 1976.**
**Chrome yellow.** Same as **Chromate of lead.**
**Chro'mium,** a metallic element, **4042;** Alaskan ore, **74;** in alloys, **99, 2507;** in armor plate, **216;** in glassmaking, **1472;** in making rubies, *pictures,* **1410, 1411;** in tanning, **1976.**
**Chro'mosome** of cell, **672,** *picture,* **395.**
**Chromosphere** of sun, **3395.**
**Chron'icle, Anglo-Saxon, 90.**
**Chronicles.** Two books of the Old Testament (originally one), supplementing history given in books of Samuel and Kings.
**Chronicles,** kept by monks, **763.**
**Chron'ograph,** a time-recording device, **803.**
**Chronol'ogy.** *See in Index* **Calendar; Time.**
**Chronom'eter,** type of clock, **803;** used on ships, **2420, 1968.**
**Chronos.** Same as **Kronos.**
**Chron'oscope,** a time-measuring device, **803.**
**Chrysalis** (*krĭs'ȧ-lĭs*) of butterfly, **661, 546, 2936,** *picture,* **548.**
**Chrysanthemum** (*krĭs-ăn'thĕ-mŭm*), cultivated flower of aster family, **762, 1396.**
**Chrysanthemum, Order of the, 979.**
**Chryseis** (*krĭ-sē'ĭs*). In Homer's 'Iliad', captive daughter of a Trojan priest of Apollo; Agamemnon refused the ransom offered by her father until Apollo sent pestilence to the Gk. camp.
**Chrysoberyl** (*krĭs'ō-bĕr-ĭl*), a precious stone, **1409, 1410.**
**Chrys'olite,** a gem; as birthstone, **1409.**
**Chrysoprase** (*krĭs'ō-prāz*), a form of quartz, **2945.**
**Chrysostom** (*krĭs'ŏs-tŏm*), **John, Saint** (347?–407). "The golden-mouthed," a monk of Antioch, most famous of Gk. fathers, called greatest orator of anc. church.
**Chrys'otile,** variety of asbestos, **225.**
**Chuck-a-luck,** game played with bean bag, **3186.**
**Chu-fu',** China, temple of Confucius, **745.**
**Chugach Mts.** Part of the St. Elias Range in Alaska (8000–10,000 ft.) w. of Copper R.
**Chu-kiang'** or **Shu-kiang'** ("Pearl River"). Same as **Canton River.**
**Chulalongkorn** (*chụ-lä-lŏng'kôrn*) (1853–1910). King of Siam; succeeded to throne 1868; introduced many reforms and greatly improved condition of country.
**Chunchos** (*chụn'chōs*), independent tribe of Indians in Peruvian forests, *pictures,* **2741, 3287.**
**Chung Hua,** town in China; Indemnity College, **2708.**
**Chungking** (*chụng-kĭng'*), China. Port in Szechwan on Yangtze; pop. 300,000; commercial center of s.w. China.
**Church, Frederick E.** (1826–1900), Amer. landscape painter, b. Hartford, Conn. ('Great Fall at Niagara'; 'Heart of the Andes'), **2634.**
**Church, Christian, 763–4;** architecture, **178–88, 662;** art. **2628;** canon law, **1972;** censorship of printing, **2918;** councils, **763–4;** Counter-Reformation, **2989, 764, 2075;** crusades, **929–32;** drama, **2259, 1033–4, 3484;** early secret services, **390;** ecclesiastical organization, **763, 2664–6;** festivals, **1070, 758;** heresies, **763, 870, 2, 2762, 3817, 1705;** Inquisition, **1780, 3304, 2763;** monks and monasticism, **2298–2302;** music of, **2377, 2378, 2379;** Nicene creed, **870;** papacy, **2664–6, 2745;** poor-relief, **2878;** Reformation, **2987–9;** relation to Holy Roman Empire, **1674–5;** sacraments, **764;** split with Greek Orthodox church, **1528.** *See also in Index* **Christianity; Papacy; Pope; Protestantism; Reformation; Roman Catholic church.**
**Church architecture, 178–88, 662;** Byzantine, **178–9, 552,** *pictures,* **182, 183, 1197, 3092;** early Christian, **179;** Egyptian influence, **1102;** Gothic, **181–8, 1198,** *pictures,* **1199, 1843;** Renaissance, **188, 2997,** *picture,* **187;** Romanesque, **180–1, 2810,** *picture,* **2811;** steeple, origin, **188,** *picture,* **295.** *See also in Index* **Cathedrals.**
**Church councils, 763–4;** Clermont, **929;** Constance, **1705;** Lateran, **2918;** Nicaea, **870, 1070;** Trent, **2989, 2085.**
**Church Fathers, 764.**
**Churchill, Lord Randolph** (1849–95). Eng. statesman, brilliant erratic Conservative free-lance leader; his wife (Jennie Jerome, of New York, d. 1922), gave him valuable assistance in politics.
**Churchill, Winston** (born 1871), Amer. novelist, b. St. Louis, Mo. ('Richard Carvel'; 'The Crisis'; 'Coniston'; 'Mr. Crewe's Career'; 'The Inside of the Cup'), **115.**
**Churchill, Winston Spencer** (born 1874). Eng. Liberal statesman, son of Lord Randolph Churchill; first lord of admiralty 1911–15; minister of munitions, 1915–18; appointed sec. for war 1918.
**Churchill,** formerly, **Fort Churchill,** Manitoba. Trading station of Hudson's Bay Co. on w. shore of Hudson Bay, at mouth of Churchill R.
**Churchill River,** in cent. Canada; rises in w. Saskatchewan, near Alberta border; flows e. and n.e. 900 mi., through many lakes, to Hudson Bay; **3128, 604, 1690,** *map,* **602–3.**
**Church of Christ, Scientist, 1080, 758.**
**Church of England.** *See in Index* **England, Church of.**
**Church of Jesus Christ of Latter-day Saints.** *See in Index* **Mormons.**
**Church of the Holy Sepulcher,** Jerusalem, **1885–6.**
**Churn, 952,** *picture,* **951;** probable origin, **543.**
**Churubusco** (*chụ-rụ-bụs'kō*), Mexico, village 6 mi. s. of Mexico City; Gen. Scott defeats Santa Anna, **2208.**
**Chuz'zlewit, Martin.** Hero of Dickens' novel 'Martin Chuzzlewit'; emigrates to America but returns to England completely disillusioned.
**Chyme** (*kīm*), food partly digested by stomach, **1011.**
**Cibber** (*sĭb'ẽr*), **Colley** (1671–1757), Eng. actor and dramatist; hero of Pope's 'Dunciad'; wrote 'Apology', amusing autobiography; poet laureate, **2848.**

**Cibola** (*sē'bō-lä*), **Seven Cities of,** believed to be on site of Zuñi, N.M.; sought by Coronado, **892, 202,** route, *map,* **3605.**
**Cicada** (*si-kā'dà*), a bug, **764–5, 1788;** distinguished from locust, **1504.**
**Cicatrization** (*sĭk-à-trĭ-zā'shŏn*), formation of scar tissue; as method of tattooing, **3440.**
**Cicero** (*sĭs'ĕ-rō*), **Marcus Tullius** (106–43 B.C.), Rom. statesman, orator, author, and philosopher, **765–6,** *picture,* **3043;** place in Latin literature, **1966;** pronunciation of name, **1968.**
**Cicero,** Ill. Suburb w. of Chicago; pop. 44,995; large electric shops.
**Cid** (*sĭd,* Span. *thĕd*), **The** (Arabic, *El Seid,* the lord), popular name of Rodrigo of Ruy Diaz (1040?–99), called also *el Campeador,* the Champion, Span. national hero; **3304, 3300;** epic poem, **3307;** subject of play by Corneille, **892.**
**Ci'der,** apple juice, **161;** vinegar, **3644.**
**Cienfuegos** (*thē-ĕn-fwā'gōs*), Cuba, on s. coast, center for sugar and tobacco trade; pop. 82,000; harbor visited by Columbus; blockaded during Span.-Amer. War; **936, 938.**
**Cierges** (*sē-ĕrzh'*), France, village between Argonne Forest and Meuse R., about 15 mi. n.w. of Verdun, **194.**
**Cigar-beetle, 370.**
**Cigarettes', 3509, 3510;** cork tips, **888.**
**Cigars', 3509, 3510;** Havana, **1600;** Key West, **1921;** Paraguay cigarmakers, *picture,* **3287.**
**Cilia** (*sĭl'i-à*) (sing. **cilium**), hairlike projections of cells; bacteria, **303;** flagellate protozoans, **3944;** lungs, **2998;** moss sperms, **2339;** plankton, **2558;** plant spores, **3173;** water snails, **3256.**
**Ciliary muscle** and **nerves** of eye, *picture,* **1214.**
**Cilia'ta,** class of protozoan animals with vibratory hairs, or cilia, **3944.**
**Cilicia** (*si-lish'i-à*). Anc. country of Asia Minor, on n.e. coast of Mediterranean, n. to crest of Taurus Mts.; noted for forests, grain, and wine; haunted by pirates during anc. Gk. ascendancy; Rom. province 64 B.C.; now part of Adana.
**Cilician Gates** (Gulek Bóghaz). Famous pass through Taurus Mts. from Cappadocia to Cilicia.
**Cimabue** (*chē-mä-bụ'ā*), **Giovanni** (1240–1302?), Florentine painter, credited with revival of painting in Italy after Dark Ages; **2628;** teacher of Giotto, **1461.**
**Cimarron** (Span., "wild"), r. of s.w. U.S., rising in Raton Mts., flows n.e. and s.e. 650 mi. to Arkansas R. near Tulsa, Okla.; *map,* **2574.**
**Cimbri** (*sĭm'brī*), a Germanic tribe; in Jutland, **997;** Marius defeats, **3046.**
**Cimmerians.** In Gk. (Homeric) myth., far western or northern people who lived in perpetual ("Cimmerian") darkness; also certain anc. historical inhabitants of the Crimea.
**Ci'mon** (507?–449 B.C.). Athenian statesman and leader in wars against Persians, son of Miltiades; fought at Salamis; drove Persians out of Thrace, Caria, and Lycia; banished 461 B.C. through influence of Pericles, but promptly recalled and restored to command of fleet.
**Cinchona** (*sĭn-kō'nà*), quinine tree, **2950;** in E. Indies, **685, 1879;** S. Amer., **1079, 2742, 3284.**
**Cincinna'ti,** Ohio., r.r. and mfg. center on Ohio R.; pop. 401,247; **766;** founded, **2572;** meat packing, **2570.**
**Cincinnati, Society of the, 2695, 766, 767.**
**Cincinnati, University of,** at Cincinnati, Ohio; municipal, co-ed.; colleges of liberal arts, medicine; schools of law, engineering; **766.**
**Cincinnati Southern Railroad, 766.**
**Cincinna'tus, Lucius Quintius** (519?–439? B.C.), dictator of Rome, **766–7.**
**"Cincinnatus of the West."** Name applied to George Washington by Lord Byron.
**Cinderel'la.** Household drudge who marries a prince in an old fairy tale of many lands; one of the most popular of all children's stories.
**Cinema** (*sĭn'ĕ-mà*), a motion picture, **2341–56.**
**Cinna, Lucius Cornelius** (d. 84 B.C.). Rom. noble, consul 87–84 B.C.; one of principal supporters of Marius against Sulla; his daughter Cornelia married Julius Caesar.
**Cin'nabar,** a mercury ore, **2200, 3390.**
**Cin'namon,** a spice, **3318, 3317, 330, 685,** *picture,* **3319.**
**Cinnamon bear, 350.**
**Cinque-foil** (*sĭnk-foil*), a five-leaved plant, **2416.**
**Cinque Ports.** Five English Channel ports (Hastings, Sandwich, Dover, Romney, Hythe), granted charter by Edward I; had special privileges for defending coast; Winchelsea and Rye added later.
**Cintra,** mountainous mass of jagged gray peaks (highest 1772 ft.) near Lisbon, Portugal, **2026.**
**Cipango** (*sĭ-păn'gō*), name given by Marco Polo to Japan, **1869.**
**Circassia** (*sẽr-kăsh'i-à*), region of n.w. Caucasus; originally independent but added to Russia by treaty of Adrianople (1829); **664.**
**Circassians,** noted for beauty, **664;** Mamelukes in Egypt, **1107;** in Macedonia, **2097;** in Turkey, **3558, 3560.**
**Circassian walnut, 3667.**
**Circe** (*sẽr'sē*), in Gk. myth., a sorceress who could turn men into beasts, **767–8.**
**Circle,** in geometry, **1422, 1423;** parallels of earth, **1968.**
**Circuit, electric,** path followed by an electric current; in simple radio sets, *pictures,* **3760;** in telegraph, **3454, 3456;** in telephone, *picture,* **3459.**
**Circuit Courts of Appeals,** U.S., **909.**
**Circular saw, 3516, 2082.**
**Circulation,** of blood, **438, 1615–7;** of sap in trees, *picture,* **3531;** why sap flows in plants, **2825–6,** *picture,* **2823.**
**Circumference,** of earth, **1064;** in geometry, **1423.**
**Circus** (Latin for "ring"), now used with various derived meanings; a show or exhibition of animals and feats of strength and skill; circular open space, as Piccadilly Circus, *picture,* **2055.**
**Cir'cus Max'imus** (Greatest Circus), huge circular building in Rome, used for chariot races and gladiatorial combats, **563, 3484.**
**Cir'rus clouds, 809,** *picture,* **808.**
**Cisalpine** (*sĭs-ăl'pĭn*) **Gaul** ("Gaul this side of Alps"), portion of n. Italy; bounded on n. by Alps, on s. by Rubicon; conquered by Rome, **674, 3046.**
**Cisalpine Republic,** former state in n. Italy, organized by Napoleon, **2393;** changed to monarchy, **2395.**
**Cisco** (*sĭs'kō*), salmon-like fish, **3733.**
**Cistercians** (*sĭs-tẽr'shăns*) or **Grey** or **White Monks,** an offshoot of the Benedictine order, **2299,** *pictures,* **2299, 2302.**
**Cith'ara** or **lyre,** fabled invention by Hermes, **1644, 1589;** of Orpheus, **2601–2.**
**Cit'ium,** Cyprus. Anc. Phoenician city on s.e. coast, now in ruins; biblical Kittim. *See in Index* **Larnaka.**
**"Citizen-king," 2067.**
**Citizenship,** membership in a state, **768;** naturalization, **2405, 3600;** Roman policy, **3045, 3046;** training children, **478–86, 1430, 2866;** in U.S., **768;** value of education, **1086.**
**Citrate** (*sĭt'rāt*). A salt of citric acid.
**Citric acid,** found in citrus fruits, **10, 1986.**
**Cit'ron, 769;** fruit and branch, *picture,* **1226.**
**Citron melon, 2196, 769.**
**Cit'rus fruits,** fruit of trees belonging to *Citrus* genus, **769;** citrous canker, **1500;** citron, **769;** grapefruit, **1499–1500;** lemon, **1985–6;** lime, **2011;** oranges, **2590;** rinds have burning oils, **3173, 1225;** scale pests, **3132–3;** vitamins in, **3652.**
**City, 769–70;** causes determining location, **1413, 3526;** chief urban centers of U.S., **3592, 3585;** free cities of Germany, **502, 1568;** oldest in world, **954;** rise in Flanders, **373, 376;** govt., **2370;** fire dept., **1257–60;** health dept., **1612, 1614;** police systems, **2865–8;** public utilities, **2932, 3701–4.**

WORLD'S LARGEST CITIES

| | | POPULATION |
|---|---|---|
| 1. | London | 7,258,000 |
| 2. | New York | 5,600,000 |
| 3. | Paris | 2,890,000 |
| 4. | Chicago | 2,700,000 |
| 5. | Tokyo | 2,175,000 |
| 6. | Berlin | 1,900,000 |
| 7. | Vienna | 1,840,000 |
| 8. | Philadelphia | 1,825,000 |
| 9. | Buenos Aires | 1,640,000 |
| 10. | Hangkow | 1,500,000 |

**City-manager plan** of govt., **2370.**
**"City of Bridges," 374, 518.**
**"City of Brotherly Love," 2760.**
**City of London, 2056.**
**City of New York, College of the,** at New York City; men; founded 1847; free tuition; liberal arts and science, technology, business and civic administration, education; **2495;** *picture,* **2497.**
**"City of Palms," 2643.**
**"City of Rams," 638.**
**'City of Savannah',** steamship, **3130.**
**"City of the Seven Hills," 3056.**
**"City of Steel," 2813.**
**City planning, 770;** Canberra, Australia, **628;** Chicago plan, **724;** Cleveland, **793,** *picture,* **792;** Detroit, **1000;** Indianapolis, **1762;** Philadelphia, **2760;** Seattle, *picture,* **769;** Springfield, Mass., **3332;** Washington, D.C., **3680, 3682, 3685.**
**City Point,** Va. Village on James R., 10 mi. n.e. of Petersburg; Grant's headquarters 1864–5.
**City-states, 769, 770;** in Germany, **502, 1568;** of Greece, **1520;** of Italy, **1842, 770;** Rom. republic, **3042.**
**Ciudad Bolivar** (*thē-ụ-dăth' bō-lē'vär*), Venezuela, city on Orinoco R.; pop. 12,000; **2600.**
**Ciudad Juarez.** *See in Index* **Juarez.**
**Ciudad Rodrigo** (*rōd-rē'gō*). Fortified frontier town in w. Spain; taken by French under Ney in 1810, retaken (1812) by British under Wellington.
**Civet** (*sĭv'ĕt*) or **civet cat,** animal intermediate between cats and hyenas; fur, **1390;** perfume, **2728.**
**Civics.** *See in Index* **Government.**
**Civil engineering,** defined, **1149.**
**Civilization, 771–5;** Aegean, **27–9;** barbarism, **771–3;** beginnings of agriculture, **43, 772, 3730;** Bronze Age, **515, 881, 1655;** cave dwellers, **666–70;** cities, **769–70;** commerce, **852;** domestication of animals, **772, 3524, 662, 668, 1684, 3198, 1670, 235;** early development, (Asia) **230, 232, 295,** (Egypt) **1098,** (Europe) **27–9, 1517, 1520, 1194, 2166–4,** (America) **288–90, 1741, 1765–72;** fire, **771, 1249;** geographical influences, **1413–6, 1578, 2790;** Gk. influence, **1517, 1522, 1525, 1529;** historical period, **773–4;** inventions **1795–1802;** iron, **772–3, 1815, 1816–7;** machinery, **1778;** in Middle Ages, **1235–6, 763, 2299;** Mohammedan contributions, **2278;** pottery, **771, 2906;** Roman influence, **3046, 3048, 1965;** savagery, **771;**

Stone Age, **3360–1, 666–8, 1957, 1655**; tools, **3514, 3360–1**; transportation, **3524–6, 3023, 441**; writing, **3816.**
**Civil law** (Roman), **1905.**
**Civil Rights Bill** (1866), passed, **1897.**
**Civil Service,** U.S., **774, 776**; Jackson's use of, **1856**; reforms, **1611, 222–3, 790, 3059.** *See also in Index* **Spoils system.**
**Civil Service Commission,** U.S., **776.**
**Civil War,** in England (1642–49), **924–6, 692–3**; Blake, **435**; Hampden, **1570**; London aids Parliament, **2056**; Oxford seat of court, **2608**; Puritans, **2937**; Scotch rebellion, **3148–9**; theaters closed, **1034.**
**Civil War,** in U.S. (1861–65), **776–81**; chief events summarized, **1667**; *Study Outline*, **3972**; Clara Barton's work, **338**; Federal uniform, **3578**; firearms, **1254, 1256**; relations with Gt. Brit., **12, 73, 3182, 3539, 781, 3084, 1468**; veterans' organizations, **2695.**
*Causes and preliminary events*, **776–7, 522–3, 3604–5**; slavery, **3249, 3368, 1401, 3391–2**; states' rights theory, **3347–8, 575**; tariff, **3437, 575**; Dred Scott decision, **1039**; Compromise of 1850, **855–6**; Kansas-Nebraska Act, **1913**; John Brown's raid, **516.**
*Leaders and chief events*, **778–80**; Antietam, **149–50**; Atlanta taken, **254**; blockade of Southern ports, **437, 968**; Bull Run, **533**; Chattanooga, **700–1**; Chancellorsville, **637**; Confederate States formed, **857–8, 777, 3571**; Jefferson Davis, **968**; draft riots in New York City, **2498**; Emancipation Proclamation, **1139–40**; Farragut, **1224–5**; first bloodshed, **322**; Ft. Sumter bombarded, **1332–3**; Fredericksburg, **1361**; Gettysburg, **1453–4**; Grant, **1498–9**; W. S. Hancock, **1571**; Jackson, **1858**; Lee, **1982–4**; Lincoln, **2011–6**; McClellan, **2094–5**; Meade, **2179**; Mobile Bay, **1225**; *Monitor* and *Merrimac*, **2286–7**; Nashville, **2398**; New Orleans taken, **1225**; Porter, **2884**; Richmond evacuated, **3019**; Sheridan, **3204–5**; Sherman, **3205–6**; Shiloh, **3206–7, 3205**; Stephens, **3353**; Thomas, **3490**; battle of Vicksburg, **3637, 2884.** *See also in Index* **Secession; Slavery;** and names of chief leaders and battles.
**Clai'borne** or **Clayborne, William** (1589?–1676?), Eng. colonist (sec. of state for Va. 1625); rebellion in Maryland, **2163.**
**Clairvoy'ance** (Fr. "clear seeing"), based on telepathy, **1718.**
**Clam,** a bivalve mollusk, **782–3, 2280**; evolutionary position, *diagram*, **128**; giant, **3201–2**, *picture*, **782.**
**Clammy locust,** a tree, **2045.**
**Clamshell dredge, 1040.**
**Clan,** origin of, **1224.**
**Clapper rail,** a marsh-bird, *picture*, **2961.**
**Clare, Saint** (1194–1253), Ital. nun, follower of St. Francis, **1355.**
**Clare.** Maritime county in n.w. of province of Munster, Ireland; 1332 sq. mi.; pop. 104,000; chief town Ennis.
**Claremont,** Calif. Fruit-growing center 30 mi. e. of Los Angeles; pop. 1800; Pomona College.
**Clarence, Duke of** (1449–78), brother of Edward IV, **1088.**
**Clar'endon, Edward Hyde, Earl of** (1609–74), Eng. historian, chancellor of Charles II, and grandfather of Mary II and Anne ('History of the Rebellion'); impeached, **694.**
**Clar'inet,** musical instrument, **3781, 2591**, *picture*, **2382.**
**'Clarissa; or the History of a Young Lady',** novel by Richardson, **2540.**
**Clark, Alvan G.** (1808–87), astronomical instrument maker, b. Ashfield, Mass.; made first achromatic lens in U.S. and many famous telescopes; **3342.**
**Clark, Champ** (1850–1921), Amer. political leader, b. Lawrenceburgh, Ky.; congressman from Missouri; Democratic leader in House, speaker 1911–19; candidate for president, **3744.**
**Clark, Francis Edward** (born 1851), Amer. Cong. clergyman, b. Aylmer, Quebec; founder and president of United Society of Christian Endeavor, **757.**
**Clark, George Rogers** (1752–1818), Amer. Rev. soldier and frontiersman, **783, 3004**; founds Louisville, **2073.**
**Clark, William** (1770–1838), Amer. soldier and explorer, b. near Charlottesville, Va.; associate of Lewis on Lewis and Clark expedition; **1989–90, 783,** *picture*, **1989.**
**Clark College.** At Worcester, Mass.; men; founded 1902; collegiate work; part of Clark Univ.
**Clarke, Marcus** (1846–81), Australian author, **268.**
**Clark Fork,** r. in Montana, Idaho, and Washington; 700 mi. to Columbia R.; called Pend d'Oreille in Washington; **846,** *maps*, **2309, 1726, 3687.**
**Clarksburg,** W. Va. A natural gas, coal, and oil center in n. of state; called "Fuel City of the Fuel State"; pop. 27,869; glass, steel, chemical works, and other mfrs.; trebled pop. 1910–20; birthplace of Stonewall Jackson.
**Clarkson, Thomas** (1760–1846), Eng. philanthropist, **3249.**
**Clarkson School of Technology.** At Potsdam, N. Y.; men; chartered 1896; language and literature, applied and economic sciences, engineering, technology.
**Clark University.** At Worcester, Mass.; men; opened 1889 (founded 1887); graduate work in mathematics, physics, chemistry, biology, anthropology, psychology, pedagogy, economics, sociology, history; undergraduate college; large proportion of teachers (1 to 4); **833.**
**Clary's Grove boys,** in Black Hawk War, **2012.**
**Class,** in biology, **412.**
**Classical literature,** influence in Renaissance, **2995–7.** *See also in Index* **Greek literature; Latin literature.**
**Classic spirit** in art, defined, **912.**
**Classification,** of animals, **127, 128, 130, 3841,** *Study Outline*, **3944–52**; of crystals, **935**; of human races, **149, 2956, 2771, 3866**; of minerals, **2248**; of plants, **473, 2831,** *Study Outline*, **3937–43**; principles of animal and plant classification, **412**; of rocks, **1417–20.**
**Claudel', Paul** (born 1868). Fr. poet and dramatist ('The Tidings Brought to Mary', drama of amazing beauty in guise of medieval folk legend).
**Claude Lorrain'** (1600–82), Fr. landscape painter; real name Claude Gelée; **2631.**
**Clau'dius I** (10 B.C.–54 A.D.), Rom. emperor, nephew of Tiberius, **3047**; conquers Britain, **1152**; poisoned, **2436.**
**Claudius, Appius.** Rom. decemvir 451–449 B.C., whose attempt to enslave Virginia, beautiful daughter of a plebian centurion, caused revolution and abolition of the decemvirate; story told in Macaulay's 'Virginius and Virginia' in the 'Lays of Ancient Rome'.
**Claudius Caecus, Appius,** Rom. patrician, chosen to censorship 312 B.C., builder of Appian Way and Claudian aqueduct; defies deputy of Pyrrhus, *picture*, **3047.**
**Clauses,** in grammar, **3175, 1493.**
**Clava'ria,** a type of coral fungus, **2375,** color plate facing **2374.**
**Claverhouse** (*klăv'ĕr-ŭs*), **John Graham of** (1649?–89), **Viscount Dundee.** Persecutor of Scotch Covenanters and Jacobite rebel; 'bonny Dundee' to Jacobites and 'bloody Claver'se' to Covenanters.
**Clav'ichord,** forerunner of the piano, **2797, 300.**
**Claw,** of animals, developed from epidermis, **3246.**
**Clay, Henry** (1777–1852), Amer. orator and political leader, **785–6**; Compromise of 1850, **855–6**; "corrupt bargain" charge, **15, 1856**; opposes construction of "Soo" Canal, **2223**; and tariff, **3437**; and War of 1812, **3671.**
**Clay, 783–5**; for brick-making, **503**; in cement mfr., **674, 676**; silica content, **3233**; soil, **3273.** *See also in Index* **Brick and tile; Pottery.**
**Clayborne, William.** *See in Index* **Claiborne.**
**Clayton, John M.** (1796–1856), U.S. senator 1829–37, 1845–49, 1851–56; sec. of state 1849–50; b. Dagsboro, Del.; negotiates Clayton-Bulwer treaty, **3444.**
**Clayton Act, 3546, 3746.**
**Clayton-Bulwer Treaty,** between U.S. and Gt. Brit. (1850), providing neither country should have exclusive control over any interoceanic canal in Cent. Amer., **3444, 2653.**
**Cleanliness,** relation to health, **1713–4.**
**Clearing house, 327.**
**Clearwater River,** Idaho. Tributary of Snake R., 200 mi. long; enters Snake at Lewiston.
**Cleaveland, Moses** (1754–1805), Amer. pioneer and soldier, b. Canterbury, Conn.; founds Cleveland, Ohio, **793.**
**Cleburne,** Tex. Mfg. city and trading point for grain, live stock, cotton, wool, etc., 45 mi. s.w. of Dallas; pop. 12,820; planing mills, granite works, cotton gins.
**Cleek,** an iron golf club, *pictures*, **1485.**
**Cleisthenes.** Same as **Clisthenes.**
**Clem'atis,** a flowering vine, **786, 2854.**
**Clémenceau** (*klā-mäṅ-sō'*), **Georges Benjamin Eugene** (born 1841), Fr. prime minister in World War, **786–7, 789.**
**Clem'ens, Samuel Langhorne** (1835–1910), "Mark Twain," **3569,** *pictures*, **115, 3021.**
**Clem'ent,** popes. For list *see in Index* **Pope.**
**Clement IV** (d. 1268), elected pope 1265, befriends Roger Bacon, **301.**
**Clement V** (1264–1314). First Avignon pope, elected 1305, abolished order of the Templars.
**Clement VII** (Giulio de' Medici) (1475?–1534), pope, besieged in Castle of S. Angelo during sack of Rome by Constable de Bourbon 1527; refused to divorce Henry VIII of England from Catherine of Aragon, and thus caused separation of Church of England from Rome; **2191, 1636.**
**Clement VII** (d. 1394), first antipope of the Great Schism; elected 1378; **3607.**
**Clement XIV** (1705–74). Elected pope 1769; suppressed the Jesuits.
**Clementine museum,** Vatican, **3055.**
**Cleobulus** (*klē-ō-bū'lŭs*) (6th cent. B.C.), Gk. sage and lyric poet, **3275.**
**Cleon** (d. 422 B.C.), Athenian politician, opponent of Pericles, and leader of the democracy; ridiculed by Aristophanes, **1537.**
**Cleopatra** (*klē-ō-pā'trä*) (69–30 B.C.), beautiful queen of Egypt, **789, 258, 1107,** *picture*, **788.**
**Cleopatra's Needles, 88, 1105,** *pictures*, **87, 2493.**
**Clepsydra** (*klĕp'sĭ-drà*), a water clock, **797,** *picture*, **798.**

**Clere'story,** in architecture, **181, 1102.**
**Clergy,** in Christian church, **764.**
**'Clermont',** first Amer. steamship, built by Fulton, **1381, 3210.**
**Clermont - Ferrand** (*klĕr - môn' - fĕ-rän'*), France, city 85 mi. w. of Lyon; pop. 65,000; 13th cent. cathedral; birthplace of Pascal; church council, **929.**
**Cleveland, Grover** (1837–1908), 22d president of U. S., **789–92;** early life, **789;** political record, **789–90, 2871, 1592.** —*Administrations,* **790–1;** civil service, **790;** Interstate Commerce Commission, **1794;** Hawaiian annexation, **1605, 3606;** Chicago World's Fair, **724, 770, 791;** labor troubles, **791;** Bering Sea arbitration, **3168, 385;** Venezuelan dispute, **3622–3, 2307.**
**Cleveland,** Ohio, on L. Erie, at mouth of Cuyahoga R.; largest city in Ohio and 5th largest in U.S.; pop. 796,841; **792–3;** cause of early growth, **2568, 2572;** government, **2370.**
**Cleveland, Mt.** Loftiest peak (10,438 ft.) in Glacier National Park.
**Cleveland Heights,** Ohio. Residential suburb of Cleveland; pop. 15,236; contains Shaker Lakes, a beautiful natural spot of 300 acres, and home of John D. Rockefeller.
**Cleves** (*klēvz*), Germany. Town in Rhine province of Prussia, near frontier of Holland; formerly cap. of duchy of Cleves; pop. 18,000; castle associated with the legend 'Knights of the Swan', immortalized in Wagner's 'Lohengrin'.
**Click beetle, 369, 371.**
**Cliff, sea,** *picture,* **2789;** Dover, **1027;** Shetland Isls., **3206.**
**Cliff Dwellers,** prehistoric race of s.w. U.S., **793–4, 844;** ancestors of Pueblo Indians, **2933;** ruins of homes, *pictures,* **203, 205, 844.**
**Clifford, Nathan** (1803–81). Amer. jurist, Rumney, N.H.; atty.-gen. in Polk's cabinet; negotiated treaty after Mex. War; associate justice U.S. Supreme Court after 1858; president Hayes-Tilden electoral commission 1877.
**Cliff swallow.** Species resembling barn swallow, and with similar habits, but with square, shorter tail.
**Clifton,** N.J. City 13 mi. n.w. of New York City near Passaic; pop. 26,470; textiles, chemicals, scales, iron products; rapid growth in last 25 years.
**Climate,** typical atmospheric conditions of a region, **794–5;** altitude causes cold, **794, 3285, 226, 2210;** atmosphere as the "climate maker," **50;** continental type, **794, 606, 3587;** distinguished from "weather," **794;** effect of Great Lakes, **1510, 2224, 2582;** effect on civilization, **1413, 1415;** evaporation, **1207, 2972;** forests maintain even moisture, **1327, 3532;** Gulf Stream, **1549;** Japan current, **2558, 77, 581;** modified by mountains, **2973, 795, 2790;** oceanic, **2558–9, 794, 1188;** prehistoric changes, **1420, 136, 1721;** rainfall, **2972–4;** snowfall in northern hemisphere, *picture-map,* **1414–5;** temperatures kept even by water, **3693;** Weather Bureau, **3708;** winds, **3750–1.** For climates of particular regions *see* in Study Outlines the regions by name. *See also in Indcx* **Weather;** and the principal topics above by name.
**Clingman's Dome.** In Great Smoky Mts., one of two highest peaks in Tenn. (6619 ft.); named for Thomas L. Clingman (1812–97), gov. of N.C. 1858–61, Confederate general.
**Clinical thermometer, 3487.**
**Clinton, De Witt** (1769–1828), Amer. statesman, b. Little Britain, N.Y.; gov. of N.Y., and U.S. senator; promoted construction of Erie Canal; presidential candidate, **2108.**
**Clinton, George** (1739–1812), Amer. Rev. patriot, b. Little Britain, N.Y.; member of Continental Congress, gov. of N.Y.; opposes Constitution, **1569;** vice-president, **1883, 2107.**
**Clinton, Sir Henry** (1738–95), Brit. general in Amer. Rev., commander-in-chief of Brit. land forces (1778–82), **219, 3004.**
**Clinton,** Ind. Coal-mining city on Wabash R. 15 mi. n. of Terre Haute; pop. 10,962; overalls, lumber, cement blocks.
**Clinton,** Iowa. On Mississippi R. about 30 mi. above Davenport; pop. 24,151; r.r. center; sugar, lumber products, machinery, wire, leather goods.
**Clinton,** Mass. Town 33 mi. w. of Boston on Nashua R.; pop. 12,979; has $15,000,000 reservoir and dam which supplies Boston and 18 towns with water.
**Clinton,** N. Y. Village 9 mi. s.w. of Utica; pop. 1300; Hamilton College.
**Clio** (*klī'ō*), in Gk. myth., muse of history, **2373,** *picture,* **156.**
**Clipper ships, 3208, 2162, 2927.**
**Clisthenes** (*klĭs'thĕ-nēz*) **or Cleisthenes** (6th cent. B.C.), Athenian statesman, democratic reformer; founded political organization of the Athenian Golden Age; **1522.**
**Clitus** (*klī'tŭs*) (d. 328 B.C.), Macedonian general and friend of Alexander the Great, **87.**
**Clive** (*klīv*), **Robert, Baron Clive of Plassey** (1725–74), founder of Brit. Empire in India, **795–6, 1753, 3180;** captures Calcutta, **573;** Warren Hastings, **1596.**
**Cloaca Maxima** (*klō-ā'kà măx'ĭ-mà*), **3183, 3041;** in modern use **3050.**
**Clocks and watches, 797–803;** astronomical, **803;** chronometer, **803, 2420,** *picture,* **2421;** chronoscopes or chronographs, **803;** Connecticut, **863, 864;** early devices, **797;** electric, **803;** mechanism, **797, 798;** pendulum, **2715, 797, 798,** *picture,* **801;** Switzerland, **386, 3416;** 24-hour clocks, **3501.**
**Clog shoes, 3220.**
**Cloisonné** (*klwä-sō-nā'*), enamel, **1145–6, 2387,** *pictures,* **1146, 1147.**
**Cloister,** covered walk in monastery, **2299.**
**'Cloister and the Hearth, The',** novel by Charles Reade, **2996.**
**Closed shop.** An industrial establishment which employs only members of labor unions.
**Clot** of blood, **438,** *picture,* **1451.**
**Cloth, 804;** asbestos, **225;** bark, **330, 501;** bleaching, **435;** cotton, **902–4;** Crusades bring new kinds to Europe, **932;** dyes, **1049;** felt, **1231;** fireproofing, **1263;** glass, **1472;** hair, **1560;** hemp, **1630;** jute, **1905–6;** knitting, **1935–7;** linen, **1291–2, 2018;** madras, **2110;** mercerized, **2198–9;** piña, **2809;** silk, **3234–40;** spinning and weaving, **3326–7;** spinning mule, **924;** tapa, **2366;** teaseling or napping, **3489–90,** *picture,* **3786;** wool, **3782–7.**
**Clothes moth, 548.**
**Cloth Hall,** Ypres, famous Gothic building, *picture,* **3834.**
**Clothing,** history of, **897–901;** hygienic, **1714;** why white is cooler than black in summer, **1620.** *See also in Indcx* **Costume.**
**Clothing industry, 805–9;** sweatshop system, **805, 3400.**
**Clotho** (*klō'thō*), one of the Fates in Gk. and Rom. myth., **1225.**
**Clotilda** (*klō-tĭl'dà*), **Saint** (d. 544), wife of Clovis, **810.**
**Clouded sulphur butterfly,** color plate, **548–9.**
**Clouds, 809;** chief types, *picture,* **808;** in the doldrums, **3750;** effect on temperature, **1000;** electricity in, **2006–7;** highest levels, *picture,* **51.**
**Clouds, Battle Above the** (Lookout Mountain), **700–1.**
**Clough** (*klŭf*), **Arthur Hugh** (1819–61), Eng. poet, typical, in his skepticism and introspection, of middle 19th cent. ('Bothie of Tober-na-Vuolich'); "Say Not the Struggle Nought Availeth," **1222.**
**Clove hitch, 1939–40.**
**Clove pink,** a flower, **2809.**
**Clover, 809–10;** fertilized by bumblebees, **362–3;** phototropism, **2828;** shamrock, **3195;** varieties, **2416.**
**Cloves,** spice, **810, 3317, 3318,** *pictures,* **3318, 3319, 1226;** Zanzibar, **3838.**
**Clo'vis** (465–511 A.D.), king of Franks, **810, 2064, 1352.**
**Clubs,** origin of, **820;** Dr. Johnson's (The Literary), **1899.**
**Club mosses, 1234.**
**Cluj.** Same as **Klausenburg.**
**Cluniac monks,** *picture,* **2302;** and Leo IX, **1988.**
**Cluny** (*klü-nē'*). Town in e.-cent. France; remains of celebrated Benedictine abbey (910); seat of Cluniacs or Congregation of Cluny.
**Cluny lace, 1950.**
**Clutch,** automobile, **283.**
**Clyde, Firth of,** estuary of Clyde R., which expands into bay; 50 mi. long, 30 mi. wide; part of Greenock near head of the estuary; Ayr is on e. shore; isls. of Arran, Bute, Great Cumbrae, Little Cumbrae; *maps,* **1152, 1159.**
**Clyde** (*klīd*) **River,** in s.w. Scotland; flows n. and n.w. 106 mi. to Firth of Clyde; great shipbuilding center; **1470.**
**Clydes'dale horse, 1685.**
**Clymene** (*klĭm'ĕ-nē*), in Gk. myth., mother of Phaethon, **2759.**
**Clytemnestra** (*klī-tĕm-nĕs'trà*), in Gk. myth., sister of Helen and wife of Agamemnon, whom she murdered, and mother of Iphigenia, Electra, and Orestes, **1382.**
**Clytie** (*klĭt'ĭ-ē*). In Gk. myth., maiden beloved and deserted by Helios, the sun, after whom she gazed till the pitying gods changed her into a sunflower.
**Cnidus** (*nī'dŭs*). Ancient Gk. city on promontory in Caria, Asia Minor; contained famous statue of Aphrodite by Praxiteles.
**Cnossus** (*nŏs'ŭs*) or **Gnossus,** anc. cap. of Crete; celebrated in Gk. myth.; Aegean remains, **28, 29, 176, 918.**
**Cnut** (*knut*) or **Canute** (994–1035), king of Danes and Norwegians, ruler of England, **639.**
**Coach-whip,** a snake, **3260.**
**Coahuila** (*kō-ä-wē'lä*). Mex. state in n. bordering on Tex.; 63,786 sq. mi.; pop. 377,000; cap. Saltillo.
**Coal, 811–5;** amount used by steamships, **3214;** anthracite, **812, 2720;** Arctic regions, **190, 2534;** Asia, **814, 744, 1752, 1867;** Australia, **264, 3638;** Austria, **269;** Belgium, **374;** bituminous, **812;** British Isles, **1150, 1158, 1160, 853, 2449, 3664, 3146;** Canada, **610, 82, 512, 640, 3617;** coke from, **824;** conservation, **869;** Czecho-Slovakia, **947;** Europe, **814, 1192, 1194;** flame, **1250;** formation, **811, 812, 1418, 1420, 1232, 2516, 2705, 2822;** France, **1348, 103;** Germany, **1443, 1444;** how it produces heat, **1619;** illuminating gas from, **1406–7;** lignite, **812;** mining, **2250, 814,** *pictures,* **2249, 812, 813;** Poland, **2857;** power production in U.S., *picture,* **3697;** Russia, **3086;** S. Africa, **3283;** S. Amer., **3289, 812;** Spain, **3302;** spontaneous combustion, **1249;** "stored sunlight," **1148–9, 3392.** —*U.S.,* **811, 814, 3590;** Ala., **70, 426;** Alaska, **74;** Appalachians, **158;** Colo., **841;** Ill., **1730,**

1732; Ind., 1760; Iowa, 1804; Kan., 1911; Ky., 1919; Md., 2160, 2162; Mo., 2270; N. D., 2522, 2524; Ohio, 2570; Okla., 2576; Pa., 2720; Utah, 3612; Va., 3650; Wash., 3688; W. Va., 3722–3; Wyo., 3820.
**Coal Age.** *See in Index* **Carboniferous period.**
**Coal gas.** Illuminating gas obtained by distilling coal. *See in Index* **Gas, coal; Gas, illuminating.**
**Coal oil** or **kerosene,** 2749.
**Coal-tar products,** 814, 816, 824, 1406; artificial indigo, 1777; benzol, 384; carbolic acid, 641–2; creosote, 918; dyes, 1050, 1444; explosives, 1212; drugs, 1042; pitch, 814, 3436; plastic materials, 673; saccharin, 3389.
**Coastal plain,** 2790; Atlantic, 3581, 2518, 3290, 3647; Gulf, 3581, 72, 3474.
**Coast and Geodetic Survey,** U. S., 3599, 3398, 3601.
**Coast artillery,** U. S., 216, 3599; insignia, 3576.
**Coaster-brake,** 493.
**Coast Guard,** U. S., 1995, 3599.
**Coast Range,** in Canada, 512; in U.S., 3580–1, 576, 2594, 3686.
**Coat** (garment), development of, 898.
**Coatesville,** Pa. Industrial city 39 mi. w. of Philadelphia; pop. 14,515; extensive iron and steel works, machine shops.
**Coat-of-arms,** 1639.
**Coat-of-mail shell,** a chiton, 3201.
**Co'balt,** city in Ontario, 280 mi. n. of Toronto; pop. 5700; mines, 816, 3242.
**Cobalt,** a metallic element, 816, 610, 4042; alloys, 99, 2507; in cnamel, 1146; in glass, 1472; in paint, 2642; in pottery-making, 2903. —*Compounds:* chloride, 1779; oxide, 1146, 2903; nitrate, 1779.
**Cobán** (*kō-bän'*). City in cent. Guatemala; pop. 31,000; trade in coffee, cocoa, vanilla, sugar cane.
**Cobb, Howell** (1815–68). Gov. of Ga. 1851–53; sec. of treasury 1857–60; pres. of Confederate Congress 1861–62.
**Cobbler fish,** *picture,* 1271.
**Cobblestone pavements,** 3027.
**Cob'den, Richard** (1804–65). Eng. Liberal statesman and laissez-faire economist; "apostle of free trade," leader of Anti-Corn-Law League, and peace advocate.
**Coblenz** (*kō'blĕnts*), Germany, fortified city, cap. of Rhenish Prussia, at confluence of Rhine and Moselle; pop. 57,000; Moselle wine; 3005; occupied by Allies after World War, 3006, 3808.
**Co'bourg,** Ontario, all-year port and summer resort on L. Ontario about 65 mi. e. of Toronto; pop. 5400; much visited by Americans; varied mfrs.; train ferry, 2967.
**Cobra** (*kō'brȧ*), venomous snake of India and Africa, 816–7, 3259, *picture,* 2286; action of poison, 3260; not a viper, 3646–7; prevalence in India, 1748.
**Coburg** (*kō'bu̇rĸ*), Germany. Mfg. town in Gotha; formerly one of caps. of duchy of Saxe-Coburg-Gotha; pop. 24,000.
**Cobweb,** 3320–3.
**Coca** (*kō'kȧ*), cocaine-yielding shrub of flax family, 2742.
**Cocaine** (*kō-kān'*), a narcotic drug, 2742, 2744, 1042; as local anesthetic, 125; chemical properties, 10; treatment for poisoning, 2855.
**Coccus** (*kŏk'ŭs*), a round bacterium, 303, 1450.
**Coccyges** (*kŏk-sī'ĝēz*), bird order, 412, *pictures,* 417; includes cuckoos, 939, kingfishers, 1925.
**Cochabamba** (*kō-chȧ-bäm'bä*), Bolivia. Mfg. city and trade center of rich grain dist. in w.; pop. 31,000.
**Co'chin China,** Fr. colony in extreme s. of Indo-China; 20,000 sq. mi.; pop. 3,500,000; cap. Saigon; 1777, *map,* 232–3.
**Cochin,** a breed of fowls, 2911, *picture,* 2909.
**Cochineal** (*kŏch'ĭ-nēl*), red dye obtained from scale insects, 817, 3133, 1050, *picture,* 3133; in ink, 1779.
**Cochlea** (*kŏk'lē-ȧ*), part of the ear, 1057.
**Cockatoo** (*kŏk-ȧ-to̧'*), crested, parrot-like bird, 817, 2690, color plate, 2690.
**Cockburn Land,** name given to n. and w. portion of Baffin Land in Amer. Arctic regions, *map,* 2514–5.
**Cockchafer.** Same as **June bug.**
**Cockle shell,** 3201.
**Cockroach,** an insect, 817–8, 1788.
**Cockscomb.** A garden plant (*Celosia cristata*) of the Amaranth family having flower heads resembling the comb of a cock in form and color.
**Cocoa,** 818, 755–6, 562.
**Cocoa butter,** 756.
**Coconut crab,** 914, *picture,* 913.
**Coconut palm,** 818–20, 2647, *pictures,* 819, 2545, 1226; fiber or coir, 516; how it spreads seeds, 3172, 2546; oil, 1227; value to Pacific islanders, 2622.
**Cocoon** (*kȯ-kọn'*), 546, 661, 2936, 1786, *picture,* 548; of silkworm, 3236–8.
**Cocos** (*kō'kŏs*) or **Keeling Islands,** group of about 20 small coral isls. s. of Java; annexed to Singapore, Straits Settlements 1903; *Emden* captured (1914), 2423.
**Cod,** a food fish, 1278; curing, *pictures,* 2536, 1286; fisheries, 1283–4, 2534, 2536, 1724, 1948, 2450; food value, 2238.
**Code** (laws), of Hammurabi, 296; of Justinian, 1905, 1972; Mosaic, 2918; of Napoleon, 2394, 2071, 3778.
**Code** (signaling), 3233, 3454; in telegraphy, 3456; semaphore, 3232.
**Codlin** or **codling moth,** insect parent of white apple worm, 820, 161.
**Cod-liver oil,** vitamin content, 3651.
**Cody** (*kō'dĭ*), **William Frederick.** *See in Index* **Buffalo Bill.**
**Cody,** Wyo., town on Shoshone R. in n.; pop. 1242; near Shoshone dam, 954; founded by "Buffalo Bill," 528.
**Coe College.** At Cedar Rapids, Iowa; co-ed.; founded 1881 (incorporated 1851 as Cedar Rapids Collegiate Institute); liberal arts.
**Coefficient** (*kō-ĕ-fish'ĕnt*), in algebra, 95.
**Coelelminthes** (*sē-lĕl-mĭn'thēz*), the round-worm animal group, 3814, 3945; evolutionary position, *diagram,* 128.
**Coelenterates** (*sē-lĕn'tē-rāts*), the group of sac-like animals, 127, 3944; corals, 886; evolutionary position, *diagram,* 128; hydra, 1708; jelly-fish, 1883–4; sea-anemone, 3164.
**Coercive Acts,** against Amer. colonies, 3001.
**Coeur d'Alene** (*kûr dȧ-lān'*), Idaho. City 30 mi. e. of Spokane, Wash., on lake of same name; pop. 6447; lumber mfrs.; farming and fruit-raising interests; fishing and hunting resort.
**Coeur d'Alene Mts.,** spur of Rockies on n.e. border of Idaho; named ("awl heart") for Indian chief noted for stinginess; 3036, 1725.
**Coffee,** 820–4; in Africa, 3, 40, 1068; Arabia, 167, 165; Brazil, 493, 495, 3022; caffeine, 823, 10, 3446; Cent. Amer., 679, 896, 1546, 2505, 3118; E. Indies, 1072, 1879, 3391; Hawaii, 1604; Porto Rico, 2885, 2886, 3586; S. Amer., 3286, 3622, 2742, 836, 495; settled by white of egg, 83; substitutes, 823, 957.
**Coffee houses,** 820, 822.
**Coffer-dam,** 954.
**Coffeyville,** Kan. City on Verdigris R. near Okla. line; extensive trade; pop. 13,452; zinc oxide smelters, oil refineries, brick, tile, and strawboard plants.
**Coffin, Charles Carleton** (1823–96). Amer. war correspondent and writer of stories for boys ('Following the Flag'; 'Winning His Way'; 'Boys of '76'; 'Marching to Victory').
**Cogia,** a whale, 3726.
**Cognac** (*kō-nyäk'*), France. Old town in s.w., famous for brandy which bears its name; pop. 20,000; on river Charente.
**Coher'er,** a radio detector, 3760–1, 3766.
**Cohoes** (*kō-hōz'*), N.Y. Mfg. city 9 mi. n. of Albany on Mohawk and Hudson rivers and on Erie Canal; pop. 22,987; abundant water-power from Mohawk Falls; large cotton and knitting mills.
**Coindet** (*kwän-dā'*), **Dr.,** 1802.
**Coins and coinage,** 2281–4, 2258–9; alloys, 1481; counterfeiting, 906; decimal system adopted in U. S., 1882; gold, 1481, 1482; gold standard and bimetallism, 2281–2, 3605–6, 1611, 791, 2104; Lydians first to use, 923, 3242; minting process, 2258; nickel, 2506; seigniorage, 2282; amount of silver used, 3242. *See also in Index* **Money.** For a list of the world's chief coins *see* the following page.
**Coir** (*koir*), coconut husk fiber, 818, 2647, 516, 3063.
**Coke,** 824, 1406, 1407; in Ala., 70; Pittsburgh, 2813; W. Va., 3723; used in making iron and steel, 1820, 1824.
**Colbert** (*kōl-bĕr'*), **Jean Baptiste** (1619–83), France's greatest financial statesman, 824–5; quoted on taxation, 3441.
**Col'borne, Sir John, Baron Seaton** (1778–1863). English soldier and administrator; lieut.-gov. of Upper Canada 1830–38.
**Colby, Bainbridge** (born 1869). Amer. lawyer and political leader, b. St. Louis; one of founders of Progressive party; sec. of state 1920–21; since associated with Woodrow Wilson in law practice.
**Colby College,** at Waterville, Me.; co-ed.; chartered 1813 by Baptists; arts and sciences; 2128.
**Col'chester,** England. Port on Colne R. 52 mi. n. e. of London; pop. 43,000; Rom. ruins; oyster fisheries; trade in grain.
**Colchis** (*kŏl'kĭs*), dist. in Caucasia at e. extremity of Black Sea; in myth., land of Golden Fleece; 232, 193, 663.
**Cold,** lack of heat, 1618; how sensed, 3520, 3521; produced artificially, 2990; by evaporation, 1207.
**Cold-frame,** for gardening, 1394.
**Cold Harbor,** Va., place 9 mi. n. e. of Richmond; battle of Gaines' Mill 1862; Grant defeated by Lee 1864 with great loss, 779, 1498.
**Colds,** causes of, 1714; effect on ear, 1056; what to do for, 1269.
**Cold storage,** preserving foodstuffs by refrigeration, 825, 2989–92; eggs, 2908, *picture,* 2991; fruit industry, 1377–8; meats, 2182, *pictures,* 2184, 2991.
**Coldstream,** Scotland. Historic border village on Tweed near famous ford; celebrated Coldstream Guards raised by Gen. Monk 1659.
**Cold wave,** 3708.
**Cole, Thomas** (1801–48), Amer. landscape painter, b. England, 2634.
**Cole, Timothy** (born 1852). Amer. wood engraver, b. England; one of foremost contemporary masters; revived a practically lost art (copied old Ital. and Span. masters).

**Coleoptera** (*kŏl-ĕ-ŏp'tĕr-à*), the beetle order, **368, 1788, 3947**; includes lady-bugs, **1955**; potato-bugs, **2902**; weevils, **3713**.
**Cole'ridge, Samuel Taylor** (1772–1834), one of Eng. "Lake Poets," **825–6, 1166**; home in Bristol, **510**; Sir Humphry Davy, **969**; Emerson, **1141**; Charles Lamb, **1958**; quoted, **1963**; Wordsworth, **3788**.
**Colet** (*kŏl'ĕt*), **John** (1467?–1519), Eng. theologian, dean of St. Paul's, **2325, 2987, 1164**.
**Col'fax, Schuyler** (1823–85), Amer. journalist, b. New York City; U.S. vice-president in Grant's first term, **1499**.
**Colgate University.** At Hamilton, N.Y.; men; founded by Baptists in 1819 but now non-sectarian; arts and sciences; theological seminary.
**Coli'as philodice** (puddle butterfly), color plate, **548**.
**Coligny** (*kō-lē-nyē'*), **Gaspard de, Admiral** (1519–72), Fr. Huguenot leader, **826**; and Henry of Navarre, **1637**.
**Colima** (*kō-lē'mä*), Mexico. State on cent.-w. coast; 2272 sq. mi.; pop. 81,000; cap. Colima.
**Col'in Clout.** Poetic name for a shepherd or countryman, used especially by Spenser.
**Colise'um.** *See in Index* **Colosseum.**
**Coll,** one of Hebrides Isls., **1625**.
**Collar-bone,** how to bandage, **1268**.
**Collar industry,** at Troy, N.Y., **3545**.
**Collateral,** property pledged as security for filling financial obligations, **328**.
**Collateral trust bonds, 3359.**
**Collective bargaining, 1078, 1947.**
**Collective nouns, 2537.**
**Collector,** on A. C. dynamo, **1052**.
**College of Cardinals, 643.**
**Colleges and universities, 827–33, 3606, 3139**; athletics, **251–2, 444, 828–9**; Canadian, **833**; entrance requirements, **829**; in Europe, **831–2, 3139**; in U.S., **829–31, 833**; value of college training, **827–8**. For list of colleges and universities of the United States and Canada *see* the following pages.
**Colleoni** (*kōl-lā-ō'nē*), **Bartolommeo** (1400–75), Ital. soldier of fortune, chiefly in service of Venice; Verrocchio's statue, **1853, 3158,** *picture,* **1204**.
**Collie, Scotch,** *picture,* **1019**.
**Col'lier, Jeremy** (1650–1726), Eng. nonjuring clergyman, writer of many controversial pamphlets; denounces theater, **1036**.
**Col'limator,** of spectroscope, **3314**.
**Col'lingwood, Cuthbert, Baron** (1750–1810). Brit. admiral; served at battle of Bunker Hill; distinguished himself at Trafalgar and assumed chief command at death of Nelson.
**Collingwood,** Ontario. Port on Georgian Bay about 75 mi. n. w. of Toronto; pop. 6000; has largest steel shipbuilding yards and drydocks in Canada.
**Collins, Michael** (1890–1922). Irish statesman; Sinn Fein member House of Commons 1918–22; named head of provisional govt. of Irish Free State Jan. 14, 1922; killed from ambush Aug. 22.
**Collins, Wilkie** (1824–89). Eng. novelist ('The Woman in White'; 'The Moonstone').
**Collins, William** (1721–59), one of greatest Eng. lyric poets ('The Passions'; 'To Liberty'; 'To Evening'); died insane; **1166**.
**Collo'dion, 833**; in fiber silk, **3240**; made from cellulose, **673**.
**Collodion-cotton,** partially made gun-cotton, **673**.
**Col'loid,** a substance whose molecules gather into large, non-crystalline clusters, **4044**.
**Colocynth** (*kŏl'ō-sinth*), a cathartic drug, **1042**.
**Cologne** (*kō-lōn'*), Germany, cathedral city on Rhine; pop. 516,000; **833–4**; occupied by Allies, **3808**.
**Cologne** or **eau de Cologne,** a perfume made of alcohol scented with aromatic oils; made in Cologne, **834**.

## COINS OF THE UNITED STATES

### Gold Coins

| | |
|---|---|
| Double eagle | $20.00 |
| Eagle | $10.00 |
| Half-eagle | $ 5.00 |
| Quarter-eagle | $ 2.50 |
| Three-dollar piece (coined 1853-90) | |
| One dollar (coined 1849-90) | |
| One dollar, Louisiana Purchase Exposition, 1903 ($250,000 coined) | |
| One dollar, Lewis and Clark Exposition, 1904 ($60,000 coined) | |

### Silver Coins

Dollar
Trade dollar (limited legal tender; coined 1873-87)
Lafayette Souvenir dollar, 1899 ($50,000 coined)
Half-dollar (legal tender to $10)
Columbian half-dollar, 1893 ($2,500,000 coined)
Quarter-dollar (legal tender to $10)
Columbian quarter-dollar ($10,000 coined)
Twenty-cent piece (coined 1875-78)
Dime (legal tender to $10)
Half-dime (coined 1792-1873)
Three-cent piece (coined 1851-73)

### Nickel, Copper, and Bronze Coins

Five-cent piece (nickel; first coined 1866; legal tender to 25 cents)
Three-cent piece (nickel; coined 1865-90)
Two-cent piece (bronze; coined 1864-73)
Cent (copper; weight at first 264 grains, later 168 grains; coined 1787-1857)
Cent (nickel; coined 1857-64)
Cent (bronze; weight 48 grains; coined since 1864)
Half-cent (copper; coined 1792-1857)

## CHIEF FOREIGN COINS

The values here given for foreign coins are those of normal times, and are based on their equivalence to the coins of the United States.

| Coin | Country | U. S. Equivalent |
|---|---|---|
| Argentine (gold) | Argentina | $4.824 |
| Balboa (gold) | Panama | 1.000 |
| Bolivar (silver) | Venezuela | .193 |
| Boliviano (silver) | Bolivia | .389 |
| Cash (copper) | China | .002 |
| Centavo (copper) | Mexico | .005 |
| Centime (copper) | France | .002 |
| Colon (gold) | Costa Rica | .465 |
| Condor (gold) | Colombia | 10.000 |
| Condor (gold) | Chile | 7.300 |
| Condor (gold) | Ecuador | 4.900 |
| Cordoba (gold) | Nicaragua | 1.000 |
| Crown (silver) | Austria | .203 |
| Crown (silver) | Denmark, Norway, Sweden | .268 |
| Crown (silver) | Great Britain | 1.220 |
| Denarius (silver) | Rome (ancient) | .170 |
| Dinar (gold) | Serbia | .193 |
| Dinero (silver) | Peru | .050 |
| Dollar (gold) | British Honduras | 1.000 |
| Dollar (gold) | Colombia | 1.000 |
| Dollar (gold) | Newfoundland | 1.014 |
| Dollar (silver) | China | .498 |
| Dollar (silver) | Mexico | .440 |
| Drachma (silver) | Greece | .193 |
| Ducat (gold) | Austria | 2.280 |
| Escudo (gold) | Portugal | 1.080 |
| Farthing (copper) | Great Britain | .005 |
| Florin (silver) | Austria | .482 |
| Florin (silver) | Great Britain | .490 |
| Florin (silver) | Netherlands | .402 |
| Franc (silver) | France, Belgium, Switzerland | .193 |
| Guilder (silver) | Netherlands | .400 |
| Guinea (gold) | Great Britain | 5.092 |
| Gulden (silver) | Austria | .482 |
| Heller (copper) | Austria | .002 |
| Kopeck (copper) | Russia | $ .005 |
| Krone (see Crown) | | |
| Leu (silver) | Rumania | .193 |
| Libra (gold) | Peru | 4.866 |
| Lira (silver) | Italy | .193 |
| Lira (gold) | Turkey | 4.400 |
| Livre (silver) | Old French | .191 |
| Louis (gold) | Old French | 4.516 |
| Mark (silver) | Germany | .238 |
| Medjidie (gold) | Turkey | 4.400 |
| Milreis (silver) | Brazil | .546 |
| Milreis (gold) | Portugal | 1.080 |
| Napoleon (gold) | France | 3.860 |
| Penny (copper) | Great Britain | .020 |
| Peseta (silver) | Spain | .193 |
| Peso (silver) | Argentina | .965 |
| Pfennig (copper) | Germany | .0025 |
| Piaster (silver) | Rumania | .195 |
| Pound (gold) | Egypt | 4.943 |
| Pound (gold) | Great Britain | 4.866 |
| Pound (gold) | Turkey | 4.396 |
| Real (silver) | Spain | .050 |
| Rix-dollar (silver) | Denmark | .540 |
| Ruble (gold) | Russia | .515 |
| Rupee (silver) | India | .324 |
| Scudo (gold, silver) | Italy | .970 |
| Sen (copper) | Japan | .005 |
| Shilling (silver) | Great Britain | .240 |
| Sixpence (silver) | Great Britain | .102 |
| Sol (silver) | Peru | .490 |
| Soldo (copper) | Italy | .010 |
| Sovereign (gold) | Great Britain | 4.866 |
| Tael (customs, silver) | China | 1.400 |
| Tical (gold) | Siam | 5.000 |
| Yen (gold) | Japan (only 5, 10, 20 yen pieces) | .498 |

## A LIST OF COLLEGES AND UNIVERSITIES

### UNITED STATES

| Name | Location | Date of Founding | Students |
|---|---|---|---|
| Adelphi College | Brooklyn, N.Y. | 1896 | Co-ed. |
| Adrian College | Adrian, Mich. | 1859 | Co-ed. |
| Agnes Scott College | Decatur, Ga. | 1889 | Women |
| Akron, Municipal University of | Akron, Ohio | 1870 | Co-ed. |
| Alabama, University of | Tuscaloosa, Ala. | 1831 | Co-ed. |
| Albion College | Albion, Mich. | 1833 | Co-ed. |
| Alfred University | Alfred, N.Y. | 1836 | Co-ed. |
| Allegheny College | Meadville, Pa. | 1815 | Co-ed. |
| Alma College | Alma, Mich. | 1886 | Co-ed. |
| American University | Washington, D.C. | 1891 | Co-ed. |
| Amherst College | Amherst, Mass. | 1821 | Men |
| Arizona, University of | Tucson, Ariz. | 1885 | Co-ed. |
| Arkansas, University of | Fayetteville, Ark. | 1871 | Co-ed. |
| Armour Institute of Technology | Chicago, Ill. | 1892 | Men |
| Augustana College | Rock Island, Ill. | 1860 | Co-ed. |
| Baker University | Baldwin, Kan. | 1858 | Co-ed. |
| Baldwin-Wallace College | Berea, Ohio. | 1845 | Co-ed. |
| Barnard College | New York City | 1889 | Women |
| Bates College | Lewiston, Me. | 1864 | Co-ed. |
| Baylor University | Waco, Tex. | 1845 | Co-ed. |
| Beloit College | Beloit, Wis. | 1846 | Co-ed. |
| Berea College | Berea, Ky. | 1855 | Co-ed. |
| Bethany College | Lindsborg, Kan. | 1881 | Co-ed. |
| Boston University | Boston, Mass. | 1869 | Co-ed. |
| Bowdoin College | Brunswick, Me. | 1794 | Men |
| Brooklyn Polytechnic Institute | Brooklyn, N.Y. | 1853 | Men |
| Brown University | Providence, R.I. | 1764 | Co-ed. |
| Bryn Mawr College | Bryn Mawr, Pa. | 1885 | Women |
| Bucknell University | Lewisburg, Pa. | 1846 | Co-ed. |
| Buffalo, University of | Buffalo, N.Y. | 1846 | Co-ed. |
| Butler College | Indianapolis, Ind. | 1855 | Co-ed. |
| California, University of | Berkeley, Calif. | 1860 | Co-ed. |
| California Institute of Technology | Pasadena, Calif. | 1891 | Men |
| Canisius College | Buffalo, N.Y. | 1870 | Men |
| Carleton College | Northfield, Minn. | 1866 | Co-ed. |
| Carroll College | Waukesha, Wis. | 1846 | Co-ed. |
| Carthage College | Carthage, Ill. | 1870 | Co-ed. |
| Case School of Applied Science | Cleveland, Ohio | 1880 | Men |
| Cathedral College | New York City | 1903 | Men |
| Catholic University of America | Washington, D.C. | 1887 | Men |
| Central College | Fayette, Mo. | 1855 | Co-ed. |
| Centre College | Danville, Ky. | 1819 | Men |
| Charleston, College of | Charleston, S.C. | 1785 | Men |
| Chattanooga, University of | Chattanooga, Tenn. | 1867 | Co-ed. |
| Chicago, University of | Chicago, Ill. | 1890 | Co-ed. |
| Cincinnati, University of | Cincinnati, Ohio | 1870 | Co-ed. |
| Clark College | Worcester, Mass. | 1902 | Men |
| Clarkson School of Technology | Potsdam, N.Y. | 1896 | Men |
| Clark University | Worcester, Mass. | 1887 | Men |
| Coe College | Cedar Rapids, Iowa | 1851 | Co-ed. |
| Colby College | Waterville, Me. | 1813 | Co-ed. |
| Colgate University | Hamilton, N.Y. | 1819 | Men |
| Colorado, University of | Boulder, Colo. | 1877 | Co-ed. |
| Colorado Agricultural College | Ft. Collins, Colo. | 1871 | Co-ed. |
| Colorado College | Colorado Springs, Colo. | 1874 | Co-ed. |
| Columbia University | New York City | 1756 | Co-ed. |
| Connecticut College for Women | New London, Conn. | 1911 | Women |
| Converse College | Spartanburg, S.C. | 1890 | Women |
| Cornell College | Mt. Vernon, Iowa | 1853 | Co-ed. |
| Cornell University | Ithaca, N.Y. | 1865 | Co-ed. |
| Cotner University | Bethany, Neb. | 1888 | Co-ed. |
| Creighton University | Omaha, Neb. | 1879 | Men |
| Dakota Wesleyan University | Mitchell, S.D. | 1885 | Co-ed. |
| Dartmouth College | Hanover, N.H. | 1769 | Men |
| Davidson College | Davidson, N.C. | 1837 | Men |
| Defiance College | Defiance, Ohio | 1902 | Co-ed. |
| Delaware College | Newark, Del. | 1833 | Co-ed. |
| Denison University | Granville, Ohio | 1831 | Co-ed. |
| Denver, University of | Denver, Colo. | 1864 | Co-ed. |
| De Pauw University | Greencastle, Ind. | 1837 | Co-ed. |
| Des Moines University | Des Moines, Iowa | 1852 | Co-ed. |
| Detroit, University of | Detroit, Mich. | 1877 | Men |
| Dickinson College | Carlisle, Pa. | 1783 | Co-ed. |
| Doane College | Crete, Neb. | 1872 | Co-ed. |
| Drake University | Des Moines, Iowa | 1881 | Co-ed. |
| Drury College | Springfield, Mo. | 1873 | Co-ed. |
| Dubuque, University of | Dubuque, Iowa | 1852 | Co-ed. |
| D'Youville College | Buffalo, N.Y. | 1908 | Women |
| Earlham College | Richmond, Ind. | 1847 | Co-ed. |
| Elmira College | Elmira, N.Y. | 1855 | Women |
| Emory and Henry College | Emory, Va. | 1835 | Co-ed. |
| Emory College | Oxford, Ga. | 1836 | Men |
| Emporia, College of | Emporia, Kan. | 1882 | Co-ed. |
| Fairmount College | Wichita, Kan. | 1892 | Co-ed. |
| Fargo College | Fargo, N.D. | 1887 | Co-ed. |
| Florida, University of | Gainesville, Fla. | 1905 | Men |
| Florida State College for Women | Tallahassee, Fla. | 1857 | Women |
| Fordham University | New York City | 1841 | Men |
| Franklin and Marshall College | Lancaster, Pa. | 1787 | Men |
| Franklin College | Franklin, Ind. | 1834 | Co-ed. |
| Friends University | Wichita, Kan. | 1891 | Co-ed. |
| George Peabody College for Teachers | Nashville, Tenn. | 1875 | Co-ed. |
| Georgetown College | Georgetown, Ky. | 1829 | Co-ed |
| Georgetown University | Washington, D.C. | 1789 | Men |
| George Washington University | Washington, D.C. | 1821 | Co-ed. |
| Georgia, University of | Athens, Ga. | 1785 | Men |
| Goucher College | Baltimore, Md. | 1884 | Women |
| Grand Island College | Grand Island, Neb. | 1892 | Co-ed. |
| Grinnell College | Grinnell, Iowa | 1846 | Co-ed. |
| Gustavus Adolphus College | St. Peter, Minn. | 1862 | Co-ed. |
| Hamilton College | Clinton, N.Y. | 1793 | Men |
| Hamline University | St. Paul, Minn. | 1854 | Co-ed. |
| Hampden-Sidney College | Hampden-Sidney, Va. | 1776 | Men |
| Hanover College | Hanover, Ind. | 1827 | Co-ed. |
| Harvard University | Cambridge, Mass. | 1636 | Men |
| Hastings College | Hastings, Neb. | 1882 | Co-ed. |
| Haverford College | Haverford, Pa. | 1833 | Men |
| Heidelberg University | Tiffin, Ohio | 1850 | Co-ed. |
| Hillsdale College | Hillsdale, Mich. | 1855 | Co-ed. |
| Hiram College | Hiram, Ohio | 1850 | Co-ed. |
| Hobart College | Geneva, N.Y. | 1822 | Co-ed. |
| Holy Cross College | Worcester, Mass. | 1843 | Men |
| Hope College | Holland, Mich. | 1866 | Co-ed. |
| Hunter College | New York City | 1870 | Women |
| Huron College | Huron, S.D. | 1883 | Co-ed. |
| Idaho, University of | Moscow, Idaho | 1889 | Co-ed. |
| Illinois, University of | Urbana, Ill. | 1867 | Co-ed. |
| Illinois College | Jacksonville, Ill. | 1829 | Co-ed. |
| Illinois Wesleyan University | Bloomington, Ill. | 1850 | Co-ed. |
| Illinois Woman's College | Jacksonville, Ill. | 1846 | Women |
| Indiana State Normal School | Terre Haute, Ind. | 1870 | Co-ed. |
| Indiana University | Bloomington, Ind. | 1820 | Co-ed. |
| Iowa, State University of | Iowa City, Iowa | 1847 | Co-ed. |
| Iowa State College of Agriculture and Mechanic Arts | Ames, Iowa | 1868 | Co-ed. |
| Iowa State Teachers' College | Cedar Falls, Iowa | 1876 | Co-ed. |
| Iowa Wesleyan College | Mt. Pleasant, Iowa | 1842 | Co-ed. |
| James Millikin University | Decatur, Ill. | 1901 | Co-ed. |
| Jamestown College | Jamestown, N.D. | 1909 | Co-ed. |
| John B. Stetson University | Deland, Fla. | 1882 | Co-ed. |
| Johns Hopkins University | Baltimore, Md. | 1876 | Co-ed. |
| Kalamazoo College | Kalamazoo, Mich. | 1833 | Co-ed. |
| Kansas, University of | Lawrence, Kan. | 1866 | Co-ed. |
| Kansas State Agricultural College | Manhattan, Kan. | 1863 | Co-ed. |
| Kentucky, The State University of | Lexington, Ky. | 1865 | Co-ed. |
| Kenyon College | Gambier, Ohio | 1824 | Men |
| Knox College | Galesburg, Ill. | 1837 | Co-ed. |
| Lafayette College | Easton, Pa. | 1826 | Men |
| Lake Erie College | Painesville, Ohio | 1859 | Women |
| Lake Forest College | Lake Forest, Ill. | 1876 | Co-ed. |
| Lawrence College | Appleton, Wis. | 1847 | Co-ed. |
| Lebanon Valley College | Annville, Pa. | 1866 | Co-ed. |
| Lehigh University | Bethlehem, Pa. | 1866 | Men |
| Leland Stanford Junior University | Palo Alto, Calif. | 1885 | Co-ed. |
| Lewis Institute | Chicago, Ill. | 1896 | Co-ed. |
| Lombard College | Galesburg, Ill. | 1851 | Co-ed. |
| Louisiana State University | Baton Rouge, La. | 1860 | Co-ed. |
| Louisville, University of | Louisville, Ky. | 1837 | Co-ed. |
| Loyola College | Baltimore, Md. | 1852 | Men |
| Luther College | Decorah, Iowa | 1861 | Men |
| Macalester College | St. Paul, Minn. | 1885 | Co-ed. |
| Maine, University of | Orono, Me. | 1862 | Co-ed. |
| Manhattan College | New York City | 1853 | Men |
| Marietta College | Marietta, Ohio | 1797 | Co-ed. |
| Marquette University | Milwaukee, Wis. | 1864 | Men |
| Maryland Agricultural College | College Park, Md. | 1856 | Men |
| Maryville College | Maryville, Tenn. | 1819 | Co-ed. |

## A LIST OF COLLEGES AND UNIVERSITIES (*Continued*)

| Name | Location | Date of Founding | Students |
|---|---|---|---|
| Massachusetts Agricultural College | Amherst, Mass | 1863 | Co-ed. |
| Massachusetts Institute of Technology | Cambridge, Mass | 1861 | Co-ed. |
| Mercer University | Macon, Ga | 1833 | Men |
| Miami University | Oxford, Ohio | 1809 | Co-ed. |
| Michigan, University of | Ann Arbor, Mich | 1837 | Co-ed. |
| Michigan Agricultural College | East Lansing, Mich | 1855 | Co-ed. |
| Michigan College of Mines | Houghton, Mich | 1885 | Men |
| Middlebury College | Middlebury, Vt | 1800 | Co-ed. |
| Midland College | Atchison, Kan | 1887 | Co-ed. |
| Millsaps College | Jackson, Miss | 1892 | Co-ed. |
| Mills College | Mills College, Calif | 1885 | Women |
| Milton College | Milton, Wis | 1867 | Co-ed. |
| Milwaukee-Downer College | Milwaukee, Wis | 1895 | Women |
| Minnesota, University of | Minneapolis, Minn | 1851 | Co-ed. |
| Mississippi, University of | Oxford, Miss | 1844 | Co-ed. |
| Missouri, University of | Columbia, Mo | 1839 | Co-ed. |
| Missouri Valley College | Marshall, Mo | 1889 | Co-ed. |
| Missouri Wesleyan College | Cameron, Mo | 1883 | Co-ed. |
| Monmouth College | Monmouth, Ill | 1856 | Co-ed. |
| Montana, State University of | Missoula, Mont | 1892 | Co-ed. |
| Montana State College of Agriculture and Mechanic Arts | Bozeman, Mont | 1893 | Co-ed. |
| Morningside College | Sioux City, Iowa | 1894 | Co-ed. |
| Mount Holyoke College | South Hadley, Mass | 1836 | Women |
| Mount St. Mary's College | Emmitsburg, Md | 1808 | Men |
| Mount Union College | Alliance, Ohio | 1846 | Co-ed. |
| Muhlenberg College | Allentown, Pa | 1867 | Men |
| Muskingum College | New Concord, Ohio | 1837 | Co-ed. |
| Nebraska, University of | Lincoln, Neb | 1869 | Co-ed. |
| Nebraska Wesleyan University | University Place, Neb | 1887 | Co-ed. |
| Nevada, State University of | Reno, Nev | 1873 | Co-ed. |
| New Hampshire College of Agriculture and Mechanic Arts | Durham, N.H | 1867 | Co-ed. |
| New Mexico, University of | Albuquerque, N.M | 1889 | Co-ed. |
| New Mexico College of Agriculture and Mechanic Arts | State College, N.M | 1889 | Co-ed. |
| New York, College of the City of | New York City | 1847 | Men |
| New York State College for Teachers | Albany, N.Y | 1844 | Co-ed. |
| New York University | New York City | 1830 | Co-ed. |
| Niagara University | Niagara Falls, N.Y | 1856 | Men |
| North Carolina, University of | Chapel Hill, N.C | 1789 | Co-ed. |
| North Dakota, University of | Grand Forks, N.D | 1883 | Co-ed. |
| North Dakota Agricultural College | Fargo, N.D | 1891 | Co-ed. |
| Northwestern College | Naperville, Ill | 1861 | Co-ed. |
| Northwestern College | Watertown, Wis | 1865 | Men |
| Northwestern University | Evanston, Ill | 1851 | Co-ed. |
| Notre Dame, University of | Notre Dame, Ind | 1842 | Men |
| Oberlin College | Oberlin, Ohio | 1833 | Co-ed. |
| Occidental College | Los Angeles, Calif | 1887 | Co-ed. |
| Ohio State University | Columbus, Ohio | 1870 | Co-ed. |
| Ohio University | Athens, Ohio | 1804 | Co-ed. |
| Ohio Wesleyan University | Delaware, Ohio | 1842 | Co-ed. |
| Oklahoma, University of | Norman, Okla | 1892 | Co-ed. |
| Oklahoma Agricultural and Mechanical College | Stillwater, Okla | 1891 | Co-ed. |
| Oklahoma College for Women | Chickasha, Okla | 1908 | Women |
| Olivet College | Olivet, Mich | 1844 | Co-ed. |
| Omaha, University of | Omaha, Neb | 1908 | Co-ed. |
| Oregon, University of | Eugene, Ore | 1872 | Co-ed. |
| Ottawa University | Ottawa, Kan | 1865 | Co-ed. |
| Otterbein University | Westerville, Ohio | 1847 | Co-ed. |
| Pacific University | Forest Grove, Ore | 1849 | Co-ed. |
| Park College | Parkville, Mo | 1875 | Co-ed. |
| Parsons College | Fairfield, Iowa | 1875 | Co-ed. |
| Penn College | Oskaloosa, Iowa | 1873 | Co-ed. |
| Pennsylvania, University of | Philadelphia, Pa | 1740 | Co-ed. |
| Pennsylvania College | Gettysburg, Pa | 1832 | Co-ed. |
| Pennsylvania State College | State College, Pa | 1863 | Co-ed. |
| Pittsburgh, University of | Pittsburgh, Pa | 1787 | Co-ed. |
| Pomona College | Claremont, Calif | 1887 | Co-ed. |
| Princeton University | Princeton, N.J | 1746 | Men |
| Purdue University | Lafayette, Ind | 1869 | Co-ed. |
| Radcliffe College | Cambridge, Mass | 1879 | Women |
| Randolph-Macon College | Ashland, Va | 1830 | Men |
| Randolph-Macon Woman's College | Lynchburg, Va | 1893 | Women |
| Reed College | Portland, Ore | 1910 | Co-ed. |
| Rensselaer Polytechnic Institute | Troy, N.Y | 1824 | Men |
| Rice Institute | Houston, Tex | 1912 | Co-ed. |
| Richmond College | Richmond, Va | 1832 | Co-ed. |
| Ripon College | Ripon, Wis | 1851 | Co-ed. |
| Roanoke College | Salem, Va | 1853 | Men |
| Rochester, University of | Rochester, N.Y | 1850 | Co-ed. |
| Rockford College | Rockford, Ill | 1849 | Women |
| Rock Hill College | Ellicott City, Md | 1857 | Men |
| Rose Polytechnic Institute | Terre Haute, Ind | 1874 | Men |
| Rutgers College | New Brunswick, N.J | 1766 | Men |
| St. Catherine, College of | St. Paul, Minn | 1905 | Women |
| St. Clara College | River Forest, Ill | 1852 | Women |
| St. Elizabeth, College of | Convent Station, N.J | 1899 | Women |
| St. Francis Xavier College | Brooklyn, N.Y | 1847 | Men |
| St. John's College | Annapolis, Md | 1696 | Men |
| St. John's College | Brooklyn, N.Y | 1870 | Men |
| St. Lawrence University | Canton, N.Y | 1856 | Co-ed. |
| St. Louis University | St. Louis, Mo | 1818 | Men |
| St. Mary of the Woods | Terre Haute, Ind | 1840 | Women |
| St. Olaf College | Northfield, Minn | 1874 | Co-ed. |
| St. Stephen's College | Annandale, N.Y | 1860 | Men |
| St. Teresa, College of | Winona, Minn | 1894 | Women |
| St. Thomas, College of | St. Paul, Minn | 1885 | Men |
| Simpson College | Indianola, Iowa | 1867 | Co-ed. |
| Smith College | Northampton, Mass | 1871 | Women |
| South, University of the | Sewanee, Tenn | 1857 | Men |
| South Carolina, University of | Columbia, S.C | 1801 | Co-ed. |
| South Dakota, University of | Vermilion, S.D | 1883 | Co-ed. |
| South Dakota State College of Agriculture and Mechanic Arts | Brookings, S.D | 1883 | Co-ed. |
| Southern California, University of | Los Angeles, Calif | 1879 | Co-ed. |
| Southwestern College | Winfield, Kan | 1885 | Co-ed. |
| Southwestern Presbyterian University | Clarksville, Tenn | 1875 | Men |
| Southwestern University | Georgetown, Tex | 1873 | Co-ed. |
| Stevens Institute of Technology | Hoboken, N.J | 1870 | Men |
| Susquehanna University | Selinsgrove, Pa | 1858 | Co-ed. |
| Swarthmore College | Swarthmore, Pa | 1869 | Co-ed. |
| Sweet Briar College | Sweet Briar, Va | 1901 | Women |
| Syracuse University | Syracuse, N.Y | 1870 | Co-ed. |
| Tarkio College | Tarkio, Mo | 1883 | Co-ed. |
| Temple University | Philadelphia, Pa | 1884 | Co-ed. |
| Tennessee, University of | Knoxville, Tenn | 1794 | Co-ed. |
| Texas, University of | Austin, Tex | 1883 | Co-ed. |
| Toledo, University of | Toledo, Ohio | 1872 | Co-ed. |
| Transylvania College | Lexington, Ky | 1798 | Co-ed. |
| Trinity College | Durham, N. C | 1838 | Co-ed. |
| Trinity College | Hartford, Conn | 1823 | Men |
| Trinity College | Washington, D.C | 1900 | Women |
| Trinity University | Waxahachie, Tex | 1869 | Co-ed. |
| Tufts College | Medford, Mass | 1852 | Co-ed. |
| Tulane University | New Orleans, La | 1834 | Co-ed. |
| Union College | College View, Neb | 1891 | Co-ed. |
| Union University | Schenectady, N.Y | 1795 | Men |
| Upper Iowa University | Fayette, Iowa | 1857 | Co-ed. |
| Ursinus College | Collegeville, Pa | 1869 | Co-ed. |
| Utah, Agricultural College of | Logan, Utah | 1889 | Co-ed. |
| Utah, University of | Salt Lake City, Utah | 1850 | Co-ed. |
| Vanderbilt University | Nashville, Tenn | 1873 | Co-ed. |
| Vassar College | Poughkeepsie, N.Y | 1861 | Women |
| Vermont, University of | Burlington, Vt | 1791 | Co-ed. |
| Virginia, University of | Charlottesville, Va | 1819 | Men |
| Wabash College | Crawfordsville, Ind | 1832 | Men |
| Wake Forest College | Wake Forest, N.C | 1833 | Men |
| Washburn College | Topeka, Kan | 1865 | Co-ed. |
| Washington, State College of | Pullman, Wash | 1892 | Co-ed. |
| Washington, University of | Seattle, Wash | 1861 | Co-ed. |
| Washington and Jefferson College | Washington, Pa | 1802 | Men |
| Washington and Lee University | Lexington, Va | 1749 | Men |
| Washington College | Chestertown, Md | 1782 | Co-ed. |
| Washington University | St. Louis, Mo | 1853 | Co-ed. |
| Wellesley College | Wellesley, Mass | 1870 | Women |
| Wells College | Aurora, N.Y | 1868 | Women |
| Wesleyan College | Macon, Ga | 1836 | Women |
| Wesleyan University | Middletown, Conn | 1831 | Men |
| Western College for Women | Oxford, Ohio | 1853 | Women |
| Western Maryland College | Westminster, Md | 1867 | Co-ed. |
| Western Reserve University | Cleveland, Ohio | 1826 | Co-ed. |
| Westminster College | Fulton, Mo | 1849 | Men |
| West Virginia University | Morgantown, W. Va | 1867 | Co-ed. |

## A LIST OF COLLEGES AND UNIVERSITIES *(Concluded)*

| Name | Location | Date of Founding | Students |
|---|---|---|---|
| Wheaton College | Wheaton, Ill | 1860 | Co-ed. |
| Whitman College | Walla Walla, Wash. | 1859 | Co-ed. |
| Willamette University | Salem, Ore | 1834 | Co-ed. |
| William and Mary, The College of | Williamsburg, Va. | 1693 | Men |
| William Jewell College | Liberty, Mo | 1849 | Men |
| Williams College | Williamstown, Mass. | 1791 | Men |
| Wilson College | Chambersburg, Pa. | 1870 | Women |
| Wisconsin, University of | Madison, Wis | 1848 | Co-ed. |
| Wittenberg College | Springfield, Ohio | 1845 | Co-ed. |
| Wofford College | Spartanburg, S.C. | 1854 | Men |
| Wooster, College of | Wooster, Ohio | 1866 | Co-ed. |
| Worcester Polytechnic Institute | Worcester, Mass | 1865 | Men |
| Wyoming, University of | Laramie, Wyo | 1886 | Co-ed. |
| Yale University | New Haven, Conn. | 1701 | Men |
| Yankton College | Yankton, S.D. | 1881 | Co-ed. |
| York College | York, Neb. | 1890 | Co-ed. |

### CANADA

| | | | |
|---|---|---|---|
| Acadia University | Wolfville, N.S. | 1838 | Men |
| Alberta, University of | Edmonton, Alta | 1908 | Co-ed. |
| Bishop's College, University of | Lennoxville, Que. | 1843 | Co-ed. |
| British Columbia, University of | Vancouver, B.C. | 1915 | Co-ed. |
| Calgary, University of | Calgary, Alta. | 1913 | Co-ed. |
| Dalhousie College and University | Halifax, N.S. | 1821 | Co-ed. |
| King's College, University of | Windsor, N.S. | 1788 | Men |
| Laval University | Quebec, Que. | 1852 | Men |
| McGill University | Montreal, Que. | 1821 | Co-ed. |
| McMaster University | Toronto, Ont. | 1887 | Co-ed. |
| Manitoba, University of | Winnipeg, Manit. | 1877 | Co-ed. |
| Montreal, University of | Montreal, Que. | 1876 | Men |
| Mount Allison University | Sackville, N.B. | 1862 | Co-ed. |
| New Brunswick, University of | Fredericton, N.B. | 1800 | Co-ed. |
| Ontario Agricultural College | Guelph, Ont. | 1874 | Co-ed. |
| Ottawa, University of | Ottawa, Ont. | 1849 | Men |
| Prince of Wales College | Charlottetown, P.E.I. | 1860 | Co-ed. |
| Queen's University | Kingston, Ont. | 1841 | Co-ed. |
| Royal Military College | Kingston, Ont. | 1876 | Men |
| St. Dunstan's College | Charlottetown, P.E.I. | 1855 | Men |
| St. François Xavier, University of | Antigonish, N.S. | 1854 | Men |
| St. Joseph's College | St. Joseph, N.B. | 1864 | Men |
| Saskatchewan, University of | Saskatoon, Sask. | 1907 | Co-ed. |
| Toronto, University of | Toronto, Ont. | 1827 | Co-ed. |
| Victoria University | Toronto, Ont. | 1836 | Co-ed. |
| Western University | London, Ont. | 1863 | Men |

**Colombia,** republic, northernmost country of S. Amer.; pop. 5,000,000; area estimated between 438,000 and 482,000 sq. mi.; cap. Bogotá; **835–7,** *maps,* **835, 3288–9;** climate, **835;** government, **837;** history, **836–7, 447–8, 2648–9, 3062;** physical features, **836, 644,** *map,* **3288–9;** population, **836,** *map,* **3288–9;** products and resources, **836, 549;** rainfall, *map,* **3288–9;** vegetation, *map,* **3288–9.**

**Colombo** (*kō-lŏm'bō*), Ceylon, cap. and chief seaport, on w. coast; pop. 211,000; tea, coffee, coconut industries; coaling station; **685.**

**Colon** (*kō-lōn'*), Span. form of Columbus. *See in Index* **Columbus.**

**Colon,** Panama, seaport, n. terminus of Panama Canal and r.r.; pop. 30,000; **2649, 2662,** *picture,* **2655.**

**Co'lon,** mark of punctuation, **2936.**

**Colonel** (*kûr'nĕl*), in U.S. Army, **218;** insignia, **3576.**

**Colo'nial architecture,** U.S., **189.**

**Colonial Dames of America, National Society of,** women's patriotic society, organized 1892 for collection of colonial records and stimulation of spirit of patriotism; membership about 9000; **2695.**

**Colonies, 837;** in Africa, **40, 3279–80;** America, **111, 617, 680, 2514–5, 3289;** Australia, **267;** Brit. Empire, **513–4;** former German, **1449;** French, **1343;** Greek, **1518, 1520;** Phoenician, **2774, 650;** Roman, **3045.**

**Colonies, the Thirteen.** *See in Index* **United States History.**

**Colonna** (*kō-lōn'nä*), noble Rom. family prominent in Renaissance, **3057.**

**Colonna, Vittoria** (1490–1547). Marchioness of Pescara, Ital. poet, beloved friend of Michelangelo; one of most beautiful characters of Ital. Renaissance.

**Colonnade** (*kŏl-ŏ-nād'*), in architecture, **180.**

**Col'onsay,** one of Hebrides, **1625.**

**Col'ophon,** in medieval books, **456.**

**Color, 837, 1998;** in paints, **2642;** of rainbow, **3311;** in spectrums, **3311–4.**

**Colorado** (*kŏl-ō-rä'dō*), a Rocky Mountain state of U.S.; 103,948 sq. mi.; pop. 939,629; cap. Denver; **838–45,** *maps,* **840, 3584–5;** agriculture, **840, 841, 89,** *pictures,* **842;** cliff dwellers, **793–4, 844;** climate, **842, 2973;** Denver, **998;** fossils, **1336;** history, **844, 3778;** irrigation, **1829,** *picture,* **842;** minerals, **839–40, 841, 812, 1479, 2960;** meaning of name, **3347;** Rocky Mountains and parks, **841–4, 3035–6, 2400;** state flower, **846.**

**Colorado, University of.** State institution at Boulder, Colo.; co-ed.; opened 1877; liberal arts, medicine, law, engineering, commerce, education, pharmacy.

**Colorado College.** At Colorado Springs, Colo., co-ed.; founded 1874; arts, science, philosophy, engineering, forestry, business administration and banking.

**Colorado Desert, 3580.**

**Colorado Plateau, 3580.**

**Colorado potato beetle, 2902.**

**Colorado River,** Argentina. Rises in e. slopes of Andes, flows s.e. 620 mi. into Atlantic s. of Bahia Blanca.

**Colorado River,** in s.w. U.S., **845, 842, 3582, 2514;** Grand Canyon, **1495–7,** *picture,* **2402.**

**Colorados,** political party, **3609.**

**Colorado Springs,** Colo. Health and pleasure resort at foot of Pikes Peak, 65 mi. s. of Denver; pop. 30,105; altitude 6000 ft.; ore refineries, coal mines, and pottery and tile works; farm center; Colorado College.

**Colorado State Agricultural College.** At Ft. Collins, Colo.; co-ed.; founded 1871 (opened 1879); agriculture, science, mechanical engineering, veterinary science.

**Coloration,** of bird eggs, **407;** of feathers, **411, 1229;** protective, **2923–6, 1274–5, 411–2.**

**Color blindness, 1216.**

**Color photography, 2783.**

**Color printing, 1172,** Japanese, **1875, 1876.**

**Colossae** (*kŏ-lŏs'ē*). Anc. city in Phrygia, Asia Minor; early Christian church.

**Colosseum** (*kŏl-ŏ-sē'ŭm*), amphitheater in Rome, **3050, 3052, 3058,** *pictures,* **181, 3051.**

**Colos'si of Memnon, 2196, 1094,** *picture,* **1105.**

**Colos'sians, Epistle to the.** The 12th book of the New Testament, addressed by Paul to the Christians at Colossae.

**Colos'sus of Rhodes, 3178, 3010,** *picture,* **3179.**

**Colt, Samuel** (1814–62), Amer. mfr., b. Hartford, Conn.; invents revolver, **1256;** invents revolving-cylinder rifle, **1254,** *picture,* **1253.**

**Colt,** a young horse, **1683–4.**

**Coltsfoot.** A small herb (*Tussilago farfara*) used in medicine as remedy for coughs; has heads of yellow flowers.

**Coluber** (*kŏl'yŭ-bĕr*), a rat snake **3260.**

**Colum'ba** or **Colm, Saint** (521–597), Irish missionary to Picts and Scots, also called Columkille ("Colum of the churches"), because of great number of churches and monasteries he founded; at Iona, **1625.**

**Colum'bae,** the pigeon order of birds, **2804, 412,** *picture,* **415.**

**Columbia** (from Columbus). The feminine personification of the U.S.

**Columbia,** Mo., city near center, **10** mi. n. of Missouri R.; pop. 19,392; state univ. and other educational institutions and various mfrs.; **2272,** *picture,* **2271.**

**Columbia,** Pa. Commercial and industrial borough about 26 mi. s. e. of Harrisburg; pop. 10,836; on Susquehanna R., in rich tobacco region; founded by Quakers in 1726.

**Columbia,** S. C., cap. and seat of state univ.; in center on Congaree R.; pop. 37,524; **3292, 3290.**

**Columbian deer,** black-tailed species native to Pacific coast, **980.**

**Columbian Exposition.** *See in Index* **World's Columbian Exposition.**

**Columbian rose,** *picture,* **3067.**

**Columbia Plateau, 3580, 3588.**

**Columbia River,** formerly Oregon R., one of the largest rivers of N. Amer., **845–6, 3582, 2514,** *maps,* **616, 3687,** *picture,* **2594;** Canada, **512, 604;** discovery, **2596;** fisheries, *picture,* **1284;** Lewis and Clark, **1989;** minerals, **3123;** U.S., **2594, 3580, 3687.**

**Columbia River Highway,** Ore., **2885,** *picture,* **2594.**

**'Columbia the Gem of the Ocean',** song, **2405.**

**Columbia University,** at New York City; co-ed.; opened 1756; undergraduate courses in Columbia Col-

lege; graduate schools of law, mines, political science, pure science, architecture, philosophy, journalism; Teachers' College; Barnard College; **2491,** *picture,* **2497.**
**Columbier,** size of paper, **2673.**
**Col'umbine,** dancer courted by Harlequin in pantomimes, **846.**
**Columbine,** spring flower with five-spurred blossoms, **846, 1678.**
**Colum'bite,** a mineral, **2247.**
**Colum'bium,** a metallic element, **4042.**
**Colum'bus, Christopher** (1446?–1506), discoverer of Amer., **846–9, 109, 1416;** introduced corn into Europe, **890;** knowledge of navigation, **2422;** at Salamanca, *picture,* **847;** voyages, *map,* **110;** first voyage, **1832, 3207, 3107, 305, 1765, 937, 1561, 3718,** *pictures,* **847, 848, 3301;** 2d voyage, **1545, 3072, 2887, 1860, 3541;** 3d voyage, **3289, 1547;** 4th voyage, **835, 2156, 680, 1676, 896, 2649.**
**Columbus, Diego** (1480–1526), son of Christopher Columbus, **848, 849.**
**Columbus, Ferdinand** (1488–1539), son of Christopher Columbus, whom he accompanied on 4th voyage; wrote biography of father; famous library, **3182.**
**Columbus,** Ga., industrial city on w. border, at head of navigation on Chattahoochee R.; pop. 31,125; immense water-power for mfrs., chiefly cotton; Camp Benning, large military training school; on fall line, **1431.**
**Columbus,** Ky., town 15 mi. below Cairo, Ill.; pop. 654; Confederate stronghold in 1861; on Mississippi R., **2266.**
**Columbus,** Miss. Trade center for rich farming region and mfg. city on Tombigbee R., 8 mi. w. of Alabama border; pop. 10,501; cotton, lumber, fertilizer.
**Columbus,** N.M., town on Mex. border; pop. 2110; Villa raids, **2217.**
**Columbus,** Ohio, state cap.; pop. 237,031; in cent. part of state on Scioto R., one of most important r.r. centers in U.S.; **849, 2568, 2570;** Ohio's "jewels," **2572;** *pictures,* **2570, 2571.**
**Column,** in architecture; concrete, **529, 530,** *picture,* **530;** Corinthian, **177, 886,** *pictures,* **180, 181, 187, 2648;** Doric, **177,** *pictures,* **180,** color plate facing **176;** Egyptian, **176,** *pictures,* **178,** color plate facing **176;** Ionic, **177,** *pictures,* **180, 1206;** Persian, **176;** Roman, **177,** *picture,* **181;** Romanesque, **180,** *pictures,* **179, 184.**
**Column of Trajan,** *picture,* **1533.**
**Col'vin, Sir Sidney** (born 1845). Eng. literary and art critic, keeper of prints and drawings in Brit. Museum 1884–1912 (lives of Landor and Keats; Edinburgh edition of R. L. Stevenson's works).
**Comanches** (*kō-măn'chēz*), warlike, nomadic tribe of Plains Indians; formerly roved from Arkansas R. to Mexico; **1767, 844, 2576.**
**Combat, trial by, 1905.**
**Combes** (*kônb*), **Emile** (1835–1921). Fr. statesman; as premier (1903–05) enforced law suppressing religious orders and took steps leading to separation of church and state.
**Combination lock, 2043.**
**Combinations,** in business, **3545–6.** *See also in Index* **Trusts.**
**Combs,** anc. Gk., *picture,* **1524;** of N. Amer. Indians, *picture,* **1767.**
**Combustion, 1249, 1619;** explosives, **1211, 1212;** oxygen in, **2611–2;** phlogiston theory, **1249;** spontaneous, **1249, 303.**
**'Comédie humaine** (*kō-mā-dē' ü-măn'*), **La'** ("The Human Comedy"), series of novels by Balzac, **323.**
**Com'edy,** English, **1034, 1036;** Greek, **1031–2, 1032–3, 1537;** Latin, **1033, 1966;** Molière's comedy of manners, **2279.**
**'Comedy of Errors'.** Play by Shakespeare in which amusing series of mistakes arises from likeness between twin brothers and likeness between their two servants.
**Comenius** (*kō-mā'nĭ-ŭs*) or **Komen'ski, John Amos** (1592–1671), Moravian bishop; pioneer in modern educational methods, such as "object-lessons," and science-teaching in schools; **3655.**
**Comet** (*kŏm'ĕt*), **849–52, 240;** meteors, **2202.**
**Comic opera, 2584.**
**Comino** (*kō-mē'nō*), isl., **2131.**
**Comi'tia centuria'ta,** Rom. assembly, **3042.**
**Comitia tribu'ta,** Rom. assembly, **3044.**
**Comma,** mark of punctuation, **2934, 2936.**
**Commander,** in U.S. Navy, **2426;** insignia, **3577.**
**Commander** or **Kommander Islands,** group of isls. in Bering Sea, belonging to Russia; seal fisheries, **3167.**
**Commandments, The Ten, 2333.**
**'Commemoration Ode',** poem by Lowell, **2074, 2017.**
**Commen'sal,** a living organism which forms partnership with another, **912.** *See also in Index* **Symbiosis.**
**Commerce,** Tex., 65 mi. n.e. of Dallas; pop. 3842; trade in live stock, cotton, grain; East Texas Normal College, **3478.**
**Commerce, 852–3;** banking, **327–9;** beginnings in barter, **772, 2281;** Boards of Trade, **440–1;** cable systems, **556–61;** Cent. Amer., **680;** commercial rivalry a factor in international politics, **853,** (Africa) **40,** (Asia) **233, 2624, 3195–6,** (E. Indies) **1072,** (Mediterranean) **2194,** (Near East and Balkans) **304, 310, 2201,** (petroleum) **2755,** (Punic Wars) **3045–6, 650,** (World War) **1196, 3790;** consular service, **872, 1013;** credit, **917–8;** drugs, **1041–2;** Europe, **1194;** modern fairs, **3088, 1219–20, 1985;** geographical influences, **1188, 2517, 1578, 3526, 1517–8;** ships and ocean routes, **3207–20, 2663, 3384, 2194,** *maps,* **255, 2624–5;** S. Amer., **3286, 3289;** tariff and free trade, **3437;** transportation, **3524–6;** weights and measures, **3713–5.**—*U.S.,* **3590–1, 852, 2517;** govt. regulation, **1230, 1794, 3546, 1592;** Great Lakes, **1513, 2720, 2721,** *map,* **1511.** *History, ancient:* Carthage, **650–1;** Crete, **28, 29;** Egypt, **1102, 87;** Greece, **1517, 1520, 1522;** Oriental, **1751, 232, 2648, 3235, 3385, 3425;** Phoenicians, **2773–4, 3504;** Rome, **3046, 3047, 3048, 3235.** —*Medieval and modern:* Arabs, **2278, 2729;** effect of Crusades, **932;** fairs and markets, **1219;** Flanders, **372, 376;** fur trade, **1389, 1692, 3582;** gilds, **1459–60;** Hanseatic League, **1576;** Ital. cities, **1412, 2047, 3624–5, 904;** piracy, **2810;** Portugal, **2888, 1392–3;** slave trade, **3249;** spice and sugar trade, **1072, 3317, 3385;** U.S. clipper trade with Far East, **233, 3208, 2927.** *See also in Index* **Exploration; Trade routes; Transportation;** and names of chief commercial cities, countries, and products.
**Commerce, Chambers of, 440.**
**Commerce, Department of,** U.S., **3599–3600, 3060, 555,** chart, **3597;** Bureau of Lighthouses, **2006;** Census Bureau, **677–8;** Coast and Geodetic Survey, **3398;** Fisheries Bureau, **1280–2.**
**Commerce, schools of, 3140.**
**Commercial geography, 1416, 852–3.**
**Commines** (*kō-mēn'*), **Philippe de** (1445?–1511?). Fr. historian, called "first truly modern writer" ('Memoirs', one of classics of history).
**Commissioned officers, 218.**
**Commission government, 2370, 1392.**
**Committee of Public Safety,** French, **1370, 3027, 3028.**
**Committees,** of Congress, **860.**
**Committees of Correspondence, 1982, 1880, 2939.**
**Com'modus, Lucius Aelius Aurelius** (161–192 A.D.), Rom. emperor 180–192, son of Marcus Aurelius; brutal tyrant, assassinated; **3050.**
**Common, Boston,** famous park, **470.**
**Common carriers, 2932, 3526, 1794.**
**"Commoner, The Great."** Nickname of William Pitt the elder.
**Common law,** origin of, **1972.**
**Common Pleas, Court of, 909.**
**Commons, House of,** in Brit. Parliament, **2687–9, 555, 2317;** in Canadian Parliament, **621;** hat etiquette, **1598.**
**'Common Sense',** pamphlet by Paine, **2626.**
**Common stock, 3358.**
**Commonwealth, The,** in England (1649–59), **924–5, 2242–3.**
**Commonwealth Avenue,** Boston, **470.**
**Com'mune of Paris** (1871), **1356, 2685.**
**Commu'nion,** a sacrament, **764.**
**Com'munism,** form of social organization, **3268;** in Russia, **3087, 3095, 3269;** in Serbia, **3177.**
**Com'munist Manifesto, 2157.**
**Com'mutator,** automobile, **279;** in electric motors, **1125;** in dynamo, **1052,** *picture,* **1051.**
**Como** (*kō'mō*), beautiful lake in n. Italy at foot of Alps, 55½ sq. mi., city of Como (pop. 43,000) at s. extremity, 25 mi. n. of Milan; **3414,** *picture,* **1841.**
**Comorin** (*kŏm'ō-rĭn*), **Cape,** India, **1743.**
**Com'oro Islands,** group of small isls. in Mozambique Channel, **1986,** *map,* **40–1.**
**Company,** in U.S. Army, **218.**
**Comparative anatomy, 121, 1209.**
**Comparison,** of adjective, **25;** of adverb, **27.**
**Compass, mariner's, 853–4,** *picture,* **855;** deviation of, **1064;** gyroscopic, **1555;** importance of, **2420, 773, 3524.**
**Compass plants, 855.**
**Compensating pendulum, 2715.**
**Compiègne** (*kôn-pyĕn'*), France, historic town in n. on R. Oise, pop. 17,000; Joan of Arc taken prisoner by English, 1430; headquarters of Ger. army 1870–71; taken by Germans 1914; objective of 1918 offensive, **3805.**
**Complementary colors, 837.**
**Complex sentence, 3175.**
**Compluten'sian Polyglot Bible, 391.**
**Compositae** (*kŏm-pŏz'ĭ-tē*), family of plants with composite flowers, **1305, 3943;** typical floral structure, **236, 237.**
**Composition,** in painting, **1243–6,** *picture,* **2640;** in photography, *picture,* **2781.**
**Compostella** (*kŏm-pŏs-tā'lă*), Spain. Same as **Santiago de Compostella.**
**Compound,** in chemistry, **711–2, 4038.**
**Compound eye,** an eye composed of numerous simple eyes, **1787,** *pictures,* **1215;** of dragon-fly, **1028;** of drone bee, **362.**
**Compound interest, 2725.**
**Compound leaves, 1982.**
**Compound microscope, 2228.**
**Compound sentence, 3175.**
**Compound steam engines, 3348, 3349.**
**Compressed air, 52, 53;** in diving apparatus, **1014;** in glass-blowing, **1472;** in tunnel construction, **3552.**
**Compressed air appliances, 2846–7, 492–3, 52, 53.**
**Compressed yeast, 3828.**
**Com'promise of 1850** (U.S. history), **855–6;** Benton, **384;** Calhoun, **576;**

Fillmore, **1240**; Pierce, **2802**; Taylor, **3444–5**.
**Comptrol'ler of the Currency,** U.S., **3598.**
**Comptroller of the Treasury,** U.S., **3598.**
**Compurga'tion,** trial by, **1905.**
**Computing scale, 196,** *picture,* **199.**
**Comstock Lode, 2445, 2446;** discovered, **3240, 3242.**
**Comte** (*kônt*), **Auguste** (1798–1857), Fr. philosopher, founder of Positivist school of philosophy, **3270, 240;** quoted, **1363.**
**Comus** (*kō'mŭs*). In late Gk. myth., god of revelry; in Milton's great poem, enchanter, son of Circe, who, like her, offers a brutalizing draught to travelers.
**'Comus',** poem by Milton, **2242, 2243.**
**Concave lens, 1987, 3310.**
**Concave mirror, 2261.**
**Concepcion** (*kōn-sep-sīōn'*), Chile. City on Bio-bio R., 8 mi. from Bay of Concepcion; pop. 73,000; trade center for agricultural region; 4 times destroyed by earthquake.
**Concepcion** (Villa Concepcion), town and river port of Paraguay; pop. 25,000; **2677.**
**Concerto** (*kōn-chĕr'tō*), musical composition, **2379.**
**Conch** (*kŏnk*), a shell, **3202, 3945.**
**Conciergerie** (*kôn-syĕr-zhĕ-rē'*), prison in Paris, **2148.**
**'Conciliation with the Colonies',** Burke's speech on, **540.**
**Concilium plebis** (*kŏn-sĭl'ĭ-ŭm plĕb'-ĭs*), assembly in anc. Rome, **3043.**
**Con'clave, 2666.**
**Concord,** Mass., town 20 mi. n.w. of Boston, famous for literary and historical associations; pop. 6461; **856;** statue of 'Minute Man', **1990.**
**Concord,** N.H., cap. of state, on Merrimack R.; pop. 22,167; granite, silverware, electrical appliances, trucks, toys, wagon-wheels, textiles, printing; **2456;** capitol, *picture,* **2455.**
**Concord, battle of, 1990.**
**Concor'dat,** a type of treaty, **3530;** French (1801), **2394.**
**Concorde** (*kôn-kôrd'*), **Place de la,** Paris, *picture,* **2682.**
**Concord grape, 1501, 1502.**
**Concrete,** building material, **856;** cement, **674–6;** construction, **531,** *pictures,* **530, 531;** pavements, **3027;** ships, **3218.**
**Condé** (*kôn-dā'*), **Louis I de Bourbon, Prince of** (1530–69), Fr. general and Huguenot leader, **826.**
**Condé, Louis II de Bourbon, Prince of** (1621–86), called "The Great Condé." Fr. general; won victory of Rocroy, 1643, which ended Span. and began Fr. military predominance.
**Con'dell, Henry** (d. 1627), Eng. actor associated with Shakespeare, **3190, 3191.**
**Condensa'tion,** of water vapor, **1000, 809.**
**Condensed milk, 2239.**
**Condenser,** electrical, **3762.**
**Condensing steam engines, 3348, 3349.**
**Condens'ite,** a plastic material, **816, 673.**
**Condillac** (*kôn-dē-yäk'*), **Etienne Bonnot de** (1715–80). Fr. philosopher; member of French Academy.
**Con'diments and spices, 3317–9.**
**Condor** (*kŏn'dôr*), large Andean vulture, **856–7, 3662;** altitude range, **397;** young, **408.**
**Condorcet** (*kôn-dôr-sā'*), **Marie Jean Caritat, Marquis de** (1743–94). Fr. mathematician, philosopher, and revolutionist; as member of Legislative Assembly laid foundation of Fr. educational system.
**Condottieri** (*kŏn-dŏt-tyā'rē*), mercenary forces, 13th to 15th cents., **218.**
**Conduction of heat, 1619.**
**Conductiv'ity, electrical, 1110;** affected by radioactivity, **2960;** selenium, **3174;** silver, **3242.**
**Condy's fluid, 2135.**
**Cone,** of coniferous trees, **3539, 2808, 2809.**
**Cone,** of volcano, **3657–8,** *picture,* **3659.**
**Cone-bearing trees.** *See in Index* **Conifers.**
**Cone clutch, 283.**
**Cone shell, 3201,** *picture,* **3203.**
**Coney Island,** seaside resort of New York City, **857.**
**Confederate States of America, 857–8;** Civil War, **776–81;** foreign relations, **12, 3539, 1468, 3084, 3182;** Jefferson Davis, **968;** Robert E. Lee, **1982–4;** Lincoln's attitude, **2012, 2014;** Richmond cap., **3019;** A. H. Stephens, **3353.**
**Confederation, Articles of,** U.S., **3593, 3347, 3602, 2528.**
**Confirmation,** church sacrament, **764.**
**"Confirmation of the Charters,"** in Eng. history, **1087.**
**Confu'cianism,** commonly called a religion, system of ethics taught by Confucius, **858, 2993–4, 744;** in Japan, **1868.**
**Confucius** (*kŏn-fū'shŭs*), (550 – 478 B.C.), Chinese philosopher, founder of Confucianism, **858, 2993–4.**
**Congaree** (*kŏng-à-rē'*) **River,** S.C., formed 1 mi. n.w. of Columbia by junction of Saluda and Broad rivers; flows s.e. 60 mi., joining Wateree R. to form Santee; **3292.**
**Conger eel,** a large salt-water type, **1089, 1090, 127.**
**Congo, French.** *See in Index* **French Equatorial Africa.**
**Congo River,** Africa, 4th longest r. in world; length, 3000 mi.; **858–9;** basin, **33–4;** Stanley's explorations, **3338, 3339, 38;** tributaries, **36;** upper course discovered by Livingstone, **2035, 38.**
**Congo snake,** a salamander, **3112.**
**Congo State,** Belgian colony of equatorial Africa; 900,000 sq. mi.; estimated pop. between 7 and 15 millions; **859–60, 40, 376,** *maps,* **40, 859;** formed, **3338;** jungles and animal life, **34;** rubber, **3072;** slavery, **3250.**
**Congrega'tionalism,** a religious denomination; world membership about 1,425,000; **2937, 2994.**
**Congregations, Roman,** administrative commissions to aid pope, **2665–6, 1770.**
**'Congress',** U.S. warship, **2287.**
**Congress, Continental.** *See in Index* **Continental Congress.**
**Congress, Library of, 3682, 1992,** *picture,* **1993.**
**Congress Hall,** Philadelphia, **2761.**
**Congressional Medal of Honor, 976,** *picture,* **977.**
**Congressional Record, 862.**
**Congressional Union,** woman suffrage organization, **3779.**
**Congress of the United States,** the legislative branch of the govt., composed of Senate and House of Representatives, **860–2;** cabinet, **555;** capitol, *pictures,* **3680, 3681, 3683, 3595;** powers, **3593–4, 3529, 1794, 3714;** impeachment, **1740–1, 2914;** relations with the president, **1740–1, 2914, 3595, 3636.**
**Con'greve, William** (1670–1729), Eng. dramatist, one of greatest writers of comedy; plots are intricate, characters often gross and heartless, but brilliant ('The Double-Dealer'; 'Love for Love'; 'The Way of the World'); **1036.**
**Con'gruent figures,** in geometry, **1426–7.**
**Conic projection,** of maps, **2142–3.**
**Con'ifers, 3530, 3539, 1208,** *Study Outline,* **3938;** classification, **2831;** geologic history, **3533;** U.S. lumber production, **3590;** world distribution, **3533.**
**Conjuga'tion,** of verbs, **3627–8.**
**Conjunc'tions,** in grammar, **862, 1493, 3175.**
**Con'juror** or **magician, 2120.**
**Conk'ling, Roscoe** (1829–88), Amer. (N.Y.) politician, b. Albany, N.Y.; strong opponent of civil service reform; with T. C. Platt resigned U.S. Senate seat as protest against Pres. Garfield's appointment in 1881 of a political enemy; failed to obtain the "vindication" of re-election; **222.**
**Connaught** (*kŏn'ạt*), **Arthur, Duke of** (born 1850), Eng. prince, 3d son of Queen Victoria, gov.-gen. of Canada 1911–16; father of "Princess Pat"; **1089.**
**Connaught.** Smallest province of Ireland, in w.-cent.; 6845 sq. mi.; pop. 610,000.
**Conneaut** (*kŏn-ĕ-ạt'*), Ohio, ore and coal port in extreme n.e. on Conneaut Creek, 2 mi. from L. Erie; pop. 9343; **2570.**
**Connecticut** (*kŏ-nĕt'ĭ-kŭt*), southernmost of New England states; 4965 sq. mi.; pop. 1,380,631; cap. Hartford; **863–9,** *maps,* **864, 3584–5;** chief cities, **863, 864, 510, 1595, 2456;** in Ice Age, **1720;** industries, **864–6, 510, 1595, 2456;** origin of name, **3347;** physical features, **866;** state flower, **3347;** tobacco, **3509, 864,** *picture,* **865. —***History.* **867–9;** New Haven founded, **2456;** first written constitution in history, **1595, 868;** New England Confederation, **3592;** Hartford convention, **3672–3, 2108.**
**Connecticut College for Women.** At New London, Conn.; chartered 1911, opened 1915; arts and sciences, music.
**Connecticut River,** largest stream in New England; rises in northern N.H. and flows s. forming boundary between Vt. and N.H., and crosses Mass. and Conn. to Long Island Sound; **2454, 1595;** valley, **866,** *picture,* **2168.**
**Connective tissue, 452.**
**Con'nellsville,** Pa. Borough 36 mi. s.e. of Pittsburgh on Youghiogheny R.; pop. 13,804; center of important coke regions; locks, iron and steel products, glass.
**Connor, Ralph,** the pen name of Charles W. Gordon (born 1860), Canadian missionary and novelist, **624.**
**Conrad,** Holy Roman Emperors. For list *see in Index* **Holy Roman Empire.**
**Conrad II** (990?–1039), emperor, founder of Salian line, **3540.**
**Conrad III** (1093–1152), emperor, founder of Hohenstaufen line, **1672;** leads 2d Crusade, **930.**
**Conrad IV** (1228–1254), emperor, son of Frederick II, **1672.**
**Conrad** (originally **Korzeniowski**), **Joseph** (born 1857), Eng. novelist, b. in Poland ('Youth'; 'The Nigger of the Narcissus'; 'Chance'; 'Almayer's Folly'), **2541, 1167.**
**Conscription, 218;** in Canada, **620, 466, 2947;** Italy, **1839;** Prussia, **1448, 218;** Russia, **3090;** U.S. (1863), **779;** U.S. (1917), **3748, 3801.**
**Consenvoye** (*kôn-sôn-vwä'*), France. Village on Meuse, 10 mi. n. of Verdun; captured by Americans Oct. 7, 1918.
**Conservation,** of natural resources, **869–70, 3060, 3062;** fisheries, **1280–2, 3168;** forests and lumber, **869–70, 1327–31, 2673, 433, 610;** irrigation and reclamation, **1827–30;** minerals, **869;** national parks, **2399–2400;** public lands, **1959–60;** water-power, **869, 3694–5,** *picture,* **3697;** wild life, **403, 426, 431.**
**Conservation of energy, 1148–9, 2786;** and radioactivity, **2959.**

**Conservation of matter, 715.**
**Conservative party** (Canada), **618, 620;** Macdonald, **2096;** Tupper, **3553;** Borden, **466, 467.**
**Conservative party** (Gt. Brit.), **2869, 1468;** opposes repeal of Corn Laws, **2706;** Disraeli's leadership, **1013;** and Home Rule, **1811;** opposes Lloyd George's social reforms, **2041;** gains under World War coalition, **2041.**
**Consis'tory, church, 643.**
**Consolidated schools, 3139–40.**
**Con'stable, John** (1776–1837), Eng. landscape painter, called founder of modern school; first to paint fresh colors of nature and subtle atmospheric gradations ('Salisbury Cathedral'; 'The Cornfield'; 'The Valley Farm'); **2631.**
**Constable,** peace officer, **2865.**
**Con'stance,** Germany. City of Baden on L. Constance at efflux of Rhine; pop. 28,000; one of oldest towns in Germany; many fine old buildings.
**Constance, Council of** (1414–18), **1705, 764.**
**Constance, Lake,** on n.e. frontier of Switzerland formed by Rhine; at n.w. divides into 2 arms, Untersee and Ueberlingersee; **3412, 3414.**
**Con'stantine I** (born 1868), king of Greece; succeeded 1913, abdicated 1922; **1526, 3625, 3626, 3806.**
**Constantine XIII** (1394–1453), last Byzantine emperor, **552.**
**Constantine the Great** (288?–337), Rom. emperor, **870, 871, 1886, 3048.**
**Constantine,** Algeria. Fortified city on natural citadel in n.e.; pop. 65,000; leather, woolens; Rom. remains; rebuilt 313 A.D. by Constantine.
**Constantine, Arch of, 870, 3050.**
**Constantino'ple,** cap. of Turkish Empire; pop. 1,200,000; **871–2, 2646, 3560,** *pictures,* **2276, 3557, 3558;** Bosporus, **468;** Robert College, **3561;** Santa Sophia, *pictures,* **182, 183.** —*History:* founded, **870, 871;** cap. of Byzantine Empire, **551–2;** Crusaders sack, **552, 3625, 932;** Turks capture, **3559;** great fire (1729), **1262.**
**Constan'tius** (250?–306), Rom. emperor; father of Constantine the Great, **870.**
**Constantza** (*kŏn-stänt'sä*) or **Kustendje,** Rumania, port on Black Sea; pop. 28,000; anc. Tomi or Constantiana, Ovid's place of exile; taken by Central Powers in World War; **3081, 3082.**
**'Constellation'.** Famous U.S. vessel; captured Fr. frigate *Insurgente* in 1799, and won brilliant victory over the *Vengeance* in 1800.
**Constella'tions, 872, 3342,** *charts,* **873, 3343.**
**'Constitu'tion',** famous U.S. frigate, **2423, 2428, 3672, 1674.**
**Constitution,** organic law or principle of govt. of a nation or society, usually embodied in a written document; Bill of Rights, **393, 1368;** first French, **1367–8, 1370;** first written constitution, **868;** John Locke's, **3292;** influence of Magna Carta, **2121;** Rhode Island charter, **3009–10;** state (in U.S.), **3346, 393.** *See also in Index* **United States Constitution.**
**Constitutional Convention** (U.S.), **3593, 2761.** *See also in Index* **United States Constitution.**
**Constitutional Union party** (U.S.), **2871.**
**Con'sul,** Rom. magistrate, **3042.**
**Consular service, 872, 1013, 852.**
**Consulate, French, 1370, 2394.**
**Contact bed,** a form of sewerage filter, **3183.**
**Continental climate, 794, 606, 3086, 3587–8.**
**Continental Congress** (U.S.), **First, 3593, 3001;** leaders, **1638, 3676.**
**Continental Congress** (U.S.), **Second, 3593, 3002, 3602;** leaders, **16, 1571, 1882, 1982;** Declaration of Independence, **975–6;** during Rev. War, **3003, 3615, 322;** adopts flag, **1288;** issues paper money, **2282, 3003.**
**Continental Divide,** watershed in Rocky Mt. region between streams flowing to Atlantic and those flowing to Pacific; in Colo., **839, 842,** *map,* **840;** Montana, **2308;** tourists crossing, *picture,* **3035;** in Wyo., **3818.**
**Continental money, 2282, 3003.**
**Continental shelf, 2788, 2558, 2517.**
**Continental system,** of Napoleon I, **2396, 3670, 853.**
**Continents,** the great land masses of the globe, in modern geography commonly reckoned as 7: Antarctica; Australia (2,950,000 sq. mi.); Africa (11,262,000 sq. mi.); Asia (17,250,000 sq. mi.); Europe (3,900,000 sq. mi.); N. Amer. (10,050,000 sq. mi.); S. Amer. (7,700,000 sq. mi.); comparative bulk and height, *picture,* **2791;** origin of, **2788.**
**Continuation schools, 3141, 1086.**
**Contour map, 2143.**
**Con'traband of war, 1794.**
**Conun'drums, 3019.**
**Convec'tion of heat, 1619.**
**Convention,** a form of treaty, **3529.**
**Convention,** in U.S. politics, **2870.**
**Convention, The National,** Fr. assembly (1792–95), **1370;** condemns Louis XVI, **2067;** saved by Napoleon, **2392;** and Robespierre, **3027, 3028.** *See also in Index* **French Revolution.**
**Converse College.** Institution for women at Spartanburg, S.C.; founded 1890; collegiate work, music, and fine arts.
**Converter,** in copper smelter, *picture,* **883.**
**Converter, electric,** device for changing alternating current to direct; audion, **257;** rotary transformer, **3524, 3371.**
**Convex lens, 1987;** in spectacles, **3310.**
**Convex mirror, 2261.**
**Convolvula'ceae,** family of twining herbs including morning-glory and sweet potato, **3943.**
**Con'voy,** in war, **3378,** *picture,* **3792.**
**Convulsions,** treatment for, **1269.**
**"Conway Cabal," 1409, 3003.**
**Co'ny,** or European rabbit, **1585.** Also trade name given to rabbit furs imitating the more expensive varieties.
**Cook, Dr. Frederick A.** (born 1865), Arctic explorer; surgeon Peary expedition 1901–02; climbed Mt. McKinley 1906; claims discovery of North Pole, **2704, 2862.**
**Cook, Captain James** (1728–79), Eng. explorer and navigator, **872, 874;** Alaskan voyage, *picture-map,* **75;** British Columbia, **513;** circumnavigates Antarctic Continent, **2863;** explores Australian coasts, **266–7;** in Hawaiian Isls., **1604–5;** New Zealand, **2499.**
**Cook, Mt.** In Alps of South Island of New Zealand; highest peak in Australia (12,350 ft.).
**Cooke, Jay** (1821–1905). Amer. banker, b. Sandusky, Ohio; as chief financial agent for U.S. during Civil War floated over 2 billion dollars in bond issues; failure of his firm in 1873 hastened panic that year.
**Cooke, Sir William** (1806–79), Eng. electrical engineer; built first Eng. telegraph line; **3454.**
**Cooking, 875–8, 1322;** baking powder, **10, 305;** bread and baking, **496–500;** cakes, muffins, **877–8;** camp, **599;** candies, **628–30;** eggs, **877;** meats, **877;** prehistoric, **771, 772;** soups, **875–6;** stoves, **3368;** vegetables, **877.** *See also in Index* **Baking; Food; Food values.**
**Cook Islands** or **Hervey Archipelago,** in s. Pacific; 111 sq. mi.; partly coral, remainder volcanic; natives formerly cannibals; annexed to New Zealand 1901; **2621,** *map,* **2624–5.**
**Cook Strait, 872, 2499,** *map,* **264–5.**
**Cooley, Thomas McIntyre** (1824–98). Amer. jurist, authority on constitutional law; chief justice of Mich. 1868–69; first chairman Interstate Commerce Commission 1887–91.
**Coolidge, Calvin** (born 1872). Vice-president of U.S. 1921– ; b. Plymouth, Vt.; lawyer; gov. of Mass. 1919–20.
**Coolidge, Susan,** pen name of **Sarah Chauncey Woolsey** (1835–1905). Amer. writer of verse and other books for children; quoted, **116.**
**Coon** or **raccoon, 2951–5;** fur, **1389, 1390.**
**Cooper, James Fenimore** (1789–1851), Amer. novelist, famed for vivid Indian and sea tales, **878, 112, 2541.**
**Cooper, Peter** (1791–1883), Amer. mfr. and philanthropist, b. New York; founder of Cooper Union, N.Y., for free training of young mechanics; designed and built (1830) first locomotive made in America, the "Tom Thumb," **2044, 2963;** founds glue industry, **1476.**
**Coöperative Societies,** associations of consumers or producers for economical buying or selling of commodities, **879–80;** origin, **3268;** building and loan associations, **528;** in Denmark, **996;** fruit-growing, **1379;** in Neb., **2432;** in N.D., **2525;** in Saskatchewan, **3128.**
**Cooper River,** S.C., stream 50 mi. long connected by canal with Santee R., **699, 3292.**
**Cooper's hawk, 1605,** *pictures,* **1606, 403.**
**Cooper Union.** At New York City; founded by Peter Cooper 1859 to provide free instruction to working men and women, in day and evening classes, in art, applied science, and technical knowledge bearing on industries and engineering professions.
**Coördinate conjunctions, 862.**
**Coo'sa,** a river in Georgia and Alabama, 250 mi. long; unites with the Tallapoosa to form the Alabama; *map,* **72.**
**Coot,** water-bird called a "mud-hen," **880, 2961.**
**Coote** (*kŭt*), **Sir Eyre** (1726–83), Brit. general, **1596.**
**"Cootie,"** or body louse, **2677–8,** *picture,* **2679.**
**Copais** (*kō-pā'ĭs*), former lake in Boeotia, Greece, **1527.**
**Co'pal,** a resin, **1552, 3619;** African sources, **859, 2507.**
**Copan** (*kō-pän'*). Ruined city of w. Honduras; celebrated monuments of Mayan civilization.
**Cope, Charles West** (1811–90), Eng. painter; 'The First Trial by Jury', *picture,* **1904.**
**Copenha'gen,** cap. of Denmark; pop. 510,000; **880, 996,** *pictures,* **995.**
**Copenhagen, battle of** (1801), **321, 2435.**
**Copernicus** (*kō-pēr'nĭ-kŭs*), **Nicolaus** (1473–1543), Polish astronomer, **880–1, 239, 914;** theory developed by Galileo, **1391–2,** by Kepler, **1920,** by Newton, **1506–8, 2476–8.**
**Copley** (*kŏp'lĭ*), **John Singleton** (1737–1815), Amer. portrait and historical painter, b. Boston; painted John Hancock, Samuel Adams, J. Q. Adams, and all Boston notables of his time; **2634.**
**Copley Square,** Boston, **471.**
**Coppée** (*kō-pā'*), **François Edouard Joachim** (1842–1908). Fr. poet, dramatist, and novelist.

**Copper,** 881–3, 4042; Africa, 41, 3283; alloys, 881, 104, 99, 378, 515, 2506, 2507; Brit. Columbia, 512; bronze, 515, 104; China, 744; copper-plating, 1125; Cyprus, 947, 881; found with silver, 3242; Japan, 1867; melting point, 1362; Mexico, 2210, 2211; N. Amer., 2516; occurs in proterozoic rocks, 1418; Persia, 2736; pigments, 1472, 2642; refined by electrolysis, 1125; Russia, 3086; salts used in sprays, 3331; smelting, *pictures,* 882–3, 610, 2213; S. Amer., 3289, 450, 736, 2742; Spain, 3302; sulphate, 3390, 1125; in U.S. coins, 2258; use in anc. times, 881, 295, 1098, 1741; Wales, 3664, 3665; wire, 3757. —*U.S.,* 882–3, 3590; Alaska, 74; Ariz., 202; Calif., 578; Conn., 864; Mich., 2223, 3397, 1513; Mont., 2309; N.J. (smelting), 2458; Tenn., 3468; Utah, 3610, 3612, 3118.
**Cop'peras,** ferrous sulphate, 3390.
**Copper-belly.** Same as **Copperhead.**
**Copperfield, David,** hero of Dickens' greatest novel, 'David Copperfield', 2540, 1006, 1007, 1167.
**Copper glance,** 883.
**Copperhead,** venomous Amer. pitviper, 884, 3646–7, *picture,* 3258.
**Copperhead.** Name given during Amer. Civil War to Northern men who sympathized with South.
**Cop'ra,** dried coconut meat, 818, 820, 1227; Ceylon, 685; Pacific isls., 2623, 2769, 1239; Zanzibar, 3838.
**Coptic church,** 1094, 1096, 2994; in Abyssinia, 3.
**Copts,** native Egyptians descended from anc. stock, 1094, 1096.
**Copyright and trade-marks,** 884.
**Coquelin** (*kōk-lăn'*), **Benoit Constant** (1841–1909). The greatest of modern Fr. actors; most famous rôle, 'Cyrano de Bergerac'.
**Coquina** (*kō-kē'nà*), a soft rock, 3106.
**Cor'acle,** saucer-shaped boats used in anc. Britain, 445, *picture,* 443.
**Coral,** marine polyp with limy "skeleton," 884–6, 3944; atolls of Pacific, 2620, 2621; Bahamas, 305; contains calcium carbonate, 571; evolutionary position, 128; in geology, 1418; Great Barrier Reef, 262, *picture,* 885; Mediterranean fisheries, 2194, 894, 3230.
**Coral crab,** *picture,* 886.
**Coral fungi,** *picture,* 2375.
**Coral lily,** 2009.
**Coral Sea.** Part of Pacific Ocean n.e. of Australia, named from numerous coral isls.
**Coral snake,** 3260, *picture,* 3258.
**Corbitant,** Indian chief, 3338.
**Cor'coran Art Gallery,** Washington, D.C., 3683.
**Corcy'ra.** *See in Index* **Corfu.**
**Cord,** a unit of measure, 3715.
**Cordage.** *See in Index* **Rope and twine.**
**Corday', Charlotte** (1768–93), Fr. revolutionary heroine; guillotined; murders Marat, 1370.
**Corde'lia,** in Shakespeare's 'King Lear', the youngest and favorite daughter of Lear, 1926.
**Cordeliers** (*kôr-dē-lyā'*) (Society of the Friends of the Rights of Man and of the Citizen), Fr. revolutionary club; first to demand a republic; popularized motto "Liberty, Equality, Fraternity"; leaders guillotined in 1794; 961.
**Cordillera** (*kôr-dĭl-yā'rà* or *kôr-dĭl'-ēr-à*) (Span. "rope" or "chain"), great mountainous mass in w. N. Amer. and S. Amer. extending from Alaska to Cape Horn, 2515, 3580–1, 3590, 3284. Term applied originally only to Andes Mts.
**Cordite,** an explosive powder, 1212.
**Cordoba** (*kôr'dō-bä*), Argentina, city in n. center, on Rio Primero; pop. 156,000; univ. (founded 1613); exports live stock, wool, hides; observatory, 2552.
**Cor'dova,** Alaska, town on s. coast; pop. 1200; terminus of r.r. from Kennecott 197 mi. n.e.; street scene, *picture,* 77.
**Cordova or Cordoba,** city in s. Spain, on the Guadalquivir R.; pop. 73,000; founded by Romans; makes textiles, silver filigree work; cordovan leather, 1977; Moorish center, 2278, 3302.
**Cordova, Califate of,** in s. Spain: founded by Moors in 8th cent., with city of Cordova as center and 8 other cities subject to its monarch; 2323.
**Cordovan leather,** 1977, 3302.
**Cor'duroy,** cloth, 804.
**Corduroy road,** 3024.
**Corelli** (*kŏ-rĕl'lē*), **Marie** (born 1864). Brit. novelist; numerous melodramatic romances with religious or ethical undertone ('Romance of Two Worlds'; 'The Sorrows of Satan'; 'The Master Christian'; 'The Life Everlasting').
**Corfu** (*kôr-fu'*) (anc. Corcyra), most northerly of Ionian Isls.; 277 sq. mi.; pop. 141,000; olives, fruit, wine, honey; cap. Corfu (pop. 28,000); refuge for Serbian army in World War, 3795.
**Corian'der,** a spice, 3317, 3318.
**Corinna** (*kō-rĭn'à*) (about 500 B.C.). Gk. lyric poet, famous for her beauty and victory over Pindar in five poetic contests.
**Cor'inth or Corinthus,** city of anc. Greece, 886, 1524; Acrocorinthus, 1520; burned by Romans, 886, 1526; gives name to currants, 940; legend of Sisyphus, 3244.
**Corinth,** Miss., town in n.e. corner; strategic point in Civil War; taken by Federals May 1862, 1498. Confederates repulsed by Rosecrans Oct. 1862.
**Corinth, Gulf of,** 1517, 1527, 1528, *map,* 1518.
**Corinth, Isthmus of,** 886; canal, 626, 886.
**Corin'thian architecture,** 177, 886, *picture,* 180.
**Corinthians, Epistles to,** 886, 2698.
**Corinto** (*kō-rēn'tō*), chief port of Nicaragua, 2505.
**Coriolanus** (*kō-rĭ-ō-lā'nŭs*), **Caius Marcius** (5th cent. B.C.). Rom. patrician, who, legend says, sought revenge for slights by leading an enemy (Volscian) army against Rome, but relinquished vengeance at plea of his mother and his wife; basis of Shakespeare's 'Coriolanus'.
**Cork,** maritime county of Munster, s. Ireland; 2890 sq. mi.; pop. 300,000; chief ports Cork, Queenstown; 888.
**Cork,** 3d city of Ireland, on s. coast; pop. 77,000; 888; Blarney Castle, *picture,* 1810; Queenstown, 2950.
**Cork,** bark of cork-oak trees, 887–8; linoleum, 2018; Pittsburgh, 2813; Portugal, 2888; Spain, 3302.
**Cork-barked elm,** a variety of Eng. elm, 1139.
**Corlaer,** N.Y., massacre, 3136.
**Corm,** a bulb-like stem, 532; of crocus, 923.
**Cor'morant,** a web-footed bird related to pelican, 413, *picture,* 751.
**Corn or maize,** 888–91; Argentina, 891; bread, 499; broom corn, 516, 3276, 1911; Burbank's "sorghum pop," *picture,* 539; canned corn, 890, 2126, 632, 633; cultivated by Indians, 1768, 890; Egypt, 1096; food value, 2926, 1321; glucose, 1475; Hungary, 1703; Indian legend of origin, 2059–60, 890; Mexico, 2213; N. Amer., 2516; oil, 1227, 890; pests, 218, 752, 3713; Rumania, 3081; silage crop, 3240; smut, 3099, 3100; starch, 3344, 890. —*U.S.,* 3536, 3588, 888; Ill., 1732, *picture,* 1733; Ind., 1758; Iowa, 1803; Minn., 2253; Mo., 2270; Ohio, 2570; Me., 2126; Neb., 2430; S.D., 3297.
**"Corn Belt,"** in U.S., 888.
**Corn bunting,** 534.
**Corn clubs,** 890.
**Corn cobs,** how used, 890.
**Cor'nea,** part of the eye, 1213, 1214.
**Corneille** (*kŏr-nā'y*), **Pierre** (1606–84), dramatist, "father of Fr. tragedy," 891–2, 1364; Racine compared with, 2957.
**Corne'lia** (2d cent. B.C.). Rom. matron, daughter of Scipio Africanus, mother of the Gracchi. "These are my jewels," she said, showing her children to a friend who asked to see her ornaments.
**Cornelius** (*kôr-nā'lē-ŭs*), **Peter von** (1784–1867). Ger. painter; revived mural painting and founded Munich school of art ('Last Judgment').
**Cornell', Ezra** (1807–74). Amer. capitalist and philanthropist, b. Westchester Landing, N.Y.; founder (1865) of Cornell Univ.
**Cornell College.** At Mount Vernon, Iowa; co-ed., Meth. Episc.; chartered 1857 (founded 1853 as Iowa Conference Seminary); arts and sciences, civil engineering, commerce, fine arts.
**Cornell University,** at Ithaca, N.Y.; co-ed.; incorporated 1865; arts and sciences, law, medicine, agriculture, architecture, civil engineering, mechanical engineering and mechanic arts; State Veterinary College; graduate courses; 1086, *picture,* 827.
**Cor'net,** a musical instrument, 1680, 1681, 2591, *picture,* 2382.
**Cornfield pea** or **cowpea,** 910.
**Cornhill,** street in London, 2051.
**Cornice,** in architecture, *picture,* 180.
**Corn'ing,** N.Y. Industrial city 13 mi. w. of Elmira on Chemung R.; pop. 15,820; market for extensive tobacco region; glass, chemicals, brick, pneumatic tools.
**Cornish,** anc. language of Cornwall, 1814.
**Cornish stone** or **feldspar,** 2883.
**Corn Island,** Nicaragua, U.S. naval base, 2505.
**Corn laws,** in Eng. history, a series of laws extending from 1436 to 1846, placing restrictions upon grain trade; repealed, 2706, 1810, 1155; Disraeli on, 1013; Gladstone, 1468.
**Cornmeal,** 890; food value, 1321.
**Cor'no, Mt.,** in Apennines, 154.
**Corn poppy,** 2880.
**Corns,** horny thickening of epidermis, 1680.
**Corn snake,** 3260.
**Cornstarch,** 3344.
**Corn syrup or glucose,** 1475.
**Corn'wall,** county in extreme s.w. England; 1357 sq. mi.; pop. 319,000; copper and tin mines famous from early times; *map,* 1159; Phoenician trade with, 3504.
**Cornwall,** Ontario. Port on St. Lawrence R., about 55 mi. s.e. of Ottawa; pop. 7500; textiles, pulp and paper, furniture.
**Cornwal'lis, Charles, Marquis** (1738–1805), Brit. general whose surrender at Yorktown, Va., 1781, ended Amer. Rev.; later gov.-gen. of India; defeats Gates, 1409; surrenders, 3004, 3677, 3831.
**Corol'la,** petal structure of a flower, 1305, 3939.
**Cor'ollary,** in geometry, 1425.
**Coroman'del Coast,** India, part of the e. coast of s. India, 1744.
**Coro'na,** of sun, 3395, 1074.
**Coronado** (*kôr-ō-nä'dō*), **Francisco Vasquez** (about 1500–45), Span. explorer of s.w. U.S., 892, 202, 1912, *maps,* 3605, 3474, 201.
**Coronation chair,** of Holy Roman Empire, 1.

**Coronel** (*kō-rō-nĕl'*), Chile. Seaport 25 mi. s. of Concepcion; naval battle 40 mi. off coast, Nov. 1, 1914, in which Brit. cruiser squadron under Admiral Cradock was defeated by Germans under Admiral Spee.
**Coroner's jury, 1904.**
**Corot** (*kō-rō'*), **Jean Baptiste** (1796–1875), Fr. landscape painter, **892–3**; 'Dance of the Nymphs', **1244**, *picture*, **1245.**
**Coro'zo** or **tagua nuts, 1854, 549.** *See also in Index* **Tagua.**
**Cor'poral,** in army, **218**; U.S. insignia, **3576.**
**Corpora'tions, 893–4**; stocks and bonds, **3358–9**; trusts, **3545–6.**
**Corps** (*kōr*), army, **218.**
**Cor'pus Chris'ti,** Tex., resort and commercial center on Corpus Christi Bay, 130 mi. s.e. of San Antonio; in agricultural and stock-raising region; pop. 10,522; extensive oyster and fishing industry, **3477.**
**Corpus Christi College,** Oxford, **2610.**
**Cor'puscle,** of blood, **437, 2999**; *pictures*, **1451, 2337.**
**Corpus'cular theory of light, 1998, 2478.**
**Correggio** (*kŏr-rĕj'ō*), **Antonio Allegri** (1494–1534), Ital. painter, master of use of light and shadow and of painting of human flesh, **2108, 2630, 2997.**
**Corregidor** (*kŏr-rĕj'ĭ-dôr*), P.I., fortified isl. in Manila Bay, **2136.**
**Correspondence,** good form in, **1185.**
**Correspondence schools, 3140, 831.**
**Corroden'tia,** an insect order, **1788.**
**Corrosive poisons, 2854.**
**Corrosive sublimate,** or bichloride of mercury, **2200, 2854.**
**"Corrupt bargain,"** charge made by Jackson against Clay, **785, 15, 1856.**
**Cor'sairs** or **Barbary pirates, 2810**; capture Cervantes, **682**; Decatur, **971**; plunder Span. and Ital. coast, **691.**
**Cor'sica,** Fr. isl. in Mediterranean; 3367 sq. mi.; pop. 300,000; **894, 1344,** *maps*, **1196–7, 1836**; belonged to Genoa, **1195, 1412**; acquired by France, **2391**; sheep, **3198.**
**Corsica'na,** Tex. Oil center 52 mi. s.e. of Dallas; pop. 11,356; cotton products, sheet metal, oil machinery.
**Cor'so Umber'to Pri'mo,** street in Rome, **3055, 3056.**
**Cort, Henry** (1740–1800), Eng. inventor and ironmaster, **1824.**
**Corte-Real** (*kôr'tā-rā-ăl'*), **Gaspar** (1450?–1501?), Port. explorer, **109.**
**Cortes** (*kôr'tĕs*), national legislative assembly of Spain, **3306.**
**Cor'tex,** any outer layer; bark of trees, *picture*, **3531**; "gray matter" of brain, **490,** *picture*, **491.**
**Cortez** (*kôr'tĕz*), **Hernando** (1485–1547), Span. explorer, conqueror of Mexico, **894–5**; conquers Aztecs, **288, 290**; Cent. Amer., **680, 1676**; introduces potatoes to Europe, **2900**; uses rubber, **3072.**
**Cortina'rius caninus,** an edible mushroom, color plate facing **2374.**
**Cort'land,** N.Y. Mfg. center 31 mi. s. of Syracuse; pop. 13,294; makes wire, motor trucks, machinery; farming trade; state normal school.
**Corun'dum,** an oxide of aluminum, **1142**; forms rubies and sapphires, **1409**; relative hardness, **2248.**
**Corunna** (*kō-rŭn'-ä*), Spain. Seaport on n.w. coast; pop. 60,000; sailing port of "Invincible Armada" (1588); repulse of French by British under Sir John Moore in Peninsular War 1809.
**Corvi'nus.** *See in Index* **Matthias I.**
**Cor'vus,** crow genus of family *Corvidae*. **412, 440, 927, 2124, 2979.**
**Cor'ydon,** Ind. Village 25 mi. w. of Louisville, Ky.; pop. 1785; cap. Indiana territory 1813–16; state cap., **1762.**
**Coryphene.** Same as **Dolphin-fish.**
**Cosette** (*kō-zĕt'*), little girl in 'Les Miserables' cared for by Jean Valjean, **1696.**
**Coshoc'ton,** Ohio, center of a coal, gas, iron, and oil region, 69 mi. n.e. of Columbus on Ohio Canal and Muskingum R.; pop. 10,847; glass, flour, paper, pipes, rubber products; pottery, **2570.**
**Cosimo** (*kō'zē-mō*), **de' Medici** (1389–1464), Florentine banker, politician, art patron, **2191, 1294.**
**Cos'mos,** aster-like flowering plant, **895.**
**Cos'sacks,** Rus. cavalrymen from steppes, renowned for daring, cruelty, and horsemanship, **895–6**; invade Siberia, **3228**; in the Ukraine, **3575**; *picture*, **2857.**
**Costa Rica** (*kŏs'tȧ rē'kȧ*), republic of Cent. Amer.; cap. San José; 23,000 sq. mi.; pop. 400,000; **896, 679, 680,** *maps*, **680, 2514–5**; birds, **680**; conquered by Spaniards, **680**; transporting bananas, *picture*, **325.**
**Cos'ter, Laurens** (15th cent.), Dutch printer, **2916.**
**Costume,** general article, **897–901**; buttons, **548–50**; Cretan, **29,** *pictures*, **28, 898**; Egyptian, **897,** *pictures*, **897, 1101**; gloves, **1474–5**; Greek, **897,** *pictures*, **898, 1516, 1519, 1535**; hair-dressing, **898–900**; hats and caps, **900, 1597–8, 1229**; medieval, **1933–4,** *pictures*, **1236, 1459**; Roman, **897,** *pictures*, **898, 3040, 3041**; shoes, **3220–3**; wigs, **898, 900,** *pictures*, **899.** For detailed survey of costume in all ages and countries, *see* Study Outline, **3997.**
**Cos'way, Richard** (1742–1821). Most brilliant Eng. miniature painter of his day; painted Mrs. Fitzherbert, Mme. Du Barry, and other ladies of fashion.
**Côteau des Prairies** (*kō-tō' dā prā-rē'*), elevated region in prairies between basins of Mississippi and Missouri rivers; in Minn., **2252.**
**Côteau du Missouri,** northwest extension of Côteau des Prairies, **2522.**
**Cotentin** (*kō-tôn-tăn'*), Norman peninsula of France, **1344, 2513.**
**Cotes, Sarah Duncan** (1862–1922). Canadian journalist and novelist ('Cinderella of Canada'; 'The Burnt Offering'); many of her novels deal with life in India.
**Cotner University.** At Bethany, Neb.; co-ed.; founded 1888 under auspices of Churches of Christ in Neb.; liberal arts, commerce, fine arts, normal courses.
**Cotopaxi** (*kō-tō-păks'ē*), **Mt.,** active volcanic peak in the Andes; in Ecuador; **1078, 123, 794.**
**Cotrone** (*kō-trō'nā*) (anc. Crotona), seaport of s. Italy on Gulf of Taranto; pop. 10,000; exports oranges, olives, licorice; most famous medical school of anc. Gk. world; home of athlete Milo; Pythagoras at, **2941.**
**Cots'wold,** a breed of sheep native to Cotswold Hills, **3200.**
**Cotswold Hills,** range extending through middle of Gloucestershire, England, **1150, 3482.**
**Cottage cheese, 709.**
**Cotton, John** (1585–1652). Learned Puritan preacher, b. in England, "patriarch of New England"; pastor first in Boston, England, then in Boston, New England.
**Cotton, 901–6**; in anc. Babylonia, **298**; bleaching, **435**; cloth introduced into Europe, **932**; diseases and pests, **906, 661, 3713, 2262,** *picture*, **904**; dyeing, **1049**; Egypt, **1096**; fabrics, **804, 904, 3782**; flower and branch, *picture*, **1226**; ginning, **902, 3735–6**; helped bring on the Civil War, **776**; India, **382, 1707**; mercerizing, **2198–9**; miscellaneous products, **906, 902, 673, 1227, 3291,** *picture*, **905**; spinning and weaving, **3326–7, 904, 3007, 2168,** *picture*, **903**; thread, **3493**; varieties, **904, 906.** —*In U.S.*, **3583–4, 2516, 3586, 3588**; Ala., **70**; Ariz., **202**; Ga., **1431**; La., **2068,** *picture*, **2470**; Miss., **2262**; N.C., **2518**; S.C., **3291, 699**; Tenn., **3468, 2198**; Tex., **3473, 3474, 953.** —*In other countries*, **1068, 3283, 329, 494, 495, 744, 2135, 2212, 2213, 2742.**
**Cotton Exposition,** New Orleans, **2471.**
**Cotton gin,** a machine to separate cotton fiber from the seed, **902**; Whitney invents, **3735–6,** *picture*, **3735.**
**Cotton manufactures,** in China, **3498**; England, **1158, 2134, 2032**; France, **1348**; Germany, **1444**; India, **382, 451, 804**; Korea, **1944**; Japan, **1866**; Spain, **330, 3301.**—*U.S.*, **3590, 3591**; Ala., **72**; Ga., **1432**; Mass., **2166, 2168, 1223**; Miss., **2264**; N.C., **2519,** *picture*, **2520**; R.I., **3007**; S.C., **3291**; Tenn., **3468.**
**Cotton-mouth,** name applied to moccasin, **2274**; copperhead, **884.**
**Cotton rat, 2977.**
**Cottonseed meal,** or oil cake, **902**; as fertilizer, **906, 1227, 3291.**
**Cottonseed oil, 1227.**
**Cotton State, 70.**
**Cotton-tail,** most common Amer. rabbit, **1584.**
**Cottonwood tree,** a poplar, **2880, 3534**; classified, **3533.**
**Cotton-worm moth,** a cotton pest destroyed by dusting with paris green; egg, *picture*, **1091.**
**Cottony-cushion scale, 3132.**
**Cottony-maple scale, 3133.**
**Cotu'it oyster, 2615.**
**Cotyledon** (*kŏt-ĭ-lē'dŏn*), of seeds, **3173, 3939**; in bean, *picture*, **348.**
**Couchant,** in heraldry, **1639.**
**Couching,** stitch in needlework, **1140.**
**Coues** (*kouz*), **Elliott** (1842–99). Amer. naturalist, authority on N. Amer. birds ('Key to North American Birds'; 'Birds of the Northwest').
**Cougar** (*kọ'gẏr*) or **puma, 2933–4**; belongs to cat family, **658.**
**Coulomb** (*kọ-lôn'*), **Charles A.** (1736–1806), Fr. physicist; founded mathematical theory of electric and magnetic action; practical unit of electric quantity was named for him; discovered "Coulomb's law" of electric attraction, **1120.**
**Coulomb.** Unit of electric quantity, defined as amount carried by current of one ampere in one second.
**Coumarin** (*kọ'mȧ-rĭn*), crystalline substance derived from sweet clover and other plants; used in perfumes and flavors; made artificially, **814.**
**Council,** in Amer. cities, **2370.**
**Council Bluffs,** Iowa. City on Missouri R. opposite Omaha, Neb.; pop. 36,162; trade center for farm implements, corn, fruit; named from council of Lewis and Clark with Indians (1804).
**Council of Blood,** formed 1567 by Duke of Alva to support Span. claim in Netherlands, **2442.**
**Council of National Defense,** U.S., composed of the secretaries of War, Navy, Interior, Agriculture, Commerce, Labor, with advisory commission of 7 prominent private citizens, **3748.**
**Council of Ten** (1310–1797), tribunal of 10, afterward 17, which governed republic of Venice, **3625.**
**Councils, church.** *See in Index* **Church councils.**

**Coun'terfeiting,** crime of making imitations of coins or paper money, **906, 2282.**
**Counterpoint,** in music, **2378.**
**Counter Reformation,** in Rom. Cath. church, **2989;** Council of Trent, **764;** Loyola, **2075;** Pius IV and Pius V, **2813.**
**Counter-shading,** in protective coloration, **2924;** in camouflage, **591.**
**Countersign.** Secret word or phrase without which no one may pass a guard or sentry.
**Counterweight,** used for counterbalancing, in elevator, **1132,** *picture,* **1133.**
**'Count of Monte Cristo',** novel by Dumas; story of Edmond Dantes, sailor, who escapes from prison, gains buried treasure, returns to dazzle Paris; **1047, 1048, 2154.**
**Country,** a geographic term, **3346.**
**County,** in U.S., a subordinate political division, **906;** in England, **1153.**
**Coup d'état** (*kō dā-tä'*), bold or brilliant stroke of statesmanship, usually unconstitutional and often accompanied with violence; particularly Napoleon III's assumption of unlimited power in 1851, **2397.**
**Cou'perus, Louis** (born 1863). Dutch novelist, whose stories of human tragedies have an Aeschylean inevitability ('The Small Souls'; 'The Later Life'; 'The Twilight of the Soul'; 'Old People and the Things that Pass').
**Couplet,** two closely connected lines in poetry, usually rhymed, and of the same length; used by Pope, **1165, 2879;** meter of, **2851.**
**Cou'pon.** A dated certificate, attached to bond or other commercial instrument; represents interest due and should be detached and presented independently.
**'Courage',** a Little Talk by Arthur Mee, **907–8,** color plate, frontispiece, Vol. 2.
**Courbet** (*kōr-bā'*), **Gustave** (1819–77). Fr. landscape, figure, and portrait painter, founder of modern realist school ('Burial at Ornans'; 'Combat of the Stags').
**Coureurs de Bois** (*kō-rûr' dē bwä*) ("runners of the woods"), Fr. Canadians in 17th cent.; lived in woods and engaged in fur trade; **617, 1692.**
**Cour'land,** a former Baltic province of Russia; 10,435 sq. mi.; pop. 812,000; becomes part of Republic of Latvia, **1969.**
**Court of Lions, Alhambra,** *picture,* **3298.**
**Courtois** (*kōr-twä'*), **Bernard** (1777–1838), Fr. chemist, discoverer of iodine, **1802.**
**Court plaster.** Sticking plaster made of silk gummed and mixed with a healing admixture; so called from former use by ladies of the court as "beauty plasters."
**Courtrai** (*kōr-trā'*), Belgium. Fortified town on Lys R., 45 mi. w. of Brussels; pop. 37,000; fine linen and lace; "Battle of Spurs" (1302), French vanquished by Flemings; battle 1918 in Ypres campaign.
**Courtship,** among birds, **405, 1372, 1544,** *pictures,* **405, 406;** spiders, **3325.**
**'Courtship of Miles Standish',** tale by Longfellow, **3338, 2057;** home of Miles Standish, *picture,* **2842.**
**Courts-martial,** military or naval courts to try offenses against military or naval law, **910.**
**Courts of Justice, 909–10;** church, **1972, 763;** equity, in England, **1972;** jury trials, **1903–5;** medieval "Court of Piepowder," **1219;** reforms of Henry II of England, **1603–4;** U.S., **909, 3593, 3594;** women on bench, **3779.** *See also in Index* **Juvenile courts; Supreme Court, U.S.**
**Court tennis,** an old form of lawn tennis, **3470.**
**Couse, E. Irving** (born 1866), Amer. painter, b. Saginaw, Mich.; painted Taos Indians in N.M.; **2634.**
**Cousin** (*kō-zăn'*), **Victor** (1792–1867), Fr. philosopher, greater as expounder of historical systems than as original thinker; called greatest modern eclectic; important figure 1830 to 1848 in reorganization of Fr. public school system; **2773.**
**Cousins, Samuel** (1801–87). Eng. mezzotint engraver; used mixed method of engraving and etching; copied many paintings by Reynolds, Lawrence, Gainsborough; work characterized by delicacy and versatility of treatment.
**Cov'enant,** of the League of Nations, **1974, 3530.**
**Covenant, Ark of the.** Sacred chest of acacia wood which Israelites took with them into Palestine; contained two stone tablets on which Ten Commandments were inscribed; placed by Solomon in temple at Jerusalem.
**Covenanters.** In Scotland, the dissenters who bound themselves by oath or covenant to maintain Presbyterian forms and doctrines; first covenant signed 1557 at inspiration of John Knox; covenant of 1638, signed at Grayfriars' Church, Edinburgh, to resist introductions of Laud's prayerbook.
**Covent Garden,** London, formerly "convent garden" of Westminster Abbey, now spacious square noted for its vegetable, fruit, and flower market; opera house, **3484.**
**Coventry,** mfg. city in England; pop. 105,000; **910.**
**Cov'erdale, Miles** (1488?–1569), Augustinian friar, bishop of Exeter, England, translator of first complete printed Eng. Bible 1535; helped edit Henry VIII's "Great Bible" (1539); **389,** *picture,* **390.**
**Cov'erley, Sir Roger de,** simple, kindly, whimsical country gentleman in the *Spectator* of Addison and Steele, **1165.**
**Cov'ington,** Ky., city on Ohio R. opposite Cincinnati; pop. 57,121; fine residential sections; mfrs., **1918.**
**Cow,** female of various bovine animals, **663, 979.** *See in Index* **Cattle.**
**Cowbird, 433;** eggs, *picture,* **404.**
**Cowdray, Weetman Dickinson Pearson,** first **Viscount** (born 1856), Eng. capitalist, head of Pearson oil interests, **2211.**
**Cowes,** seaport on n. coast of Isle of Wight; pop. 10,000; **3290.**
**Cowley, Abraham** (1618–67). Eng. poet and essayist; his sonorous lyric style was copied by Dryden and his successors of 18th cent.; wrote 'The Mistress', love verses; 'Davideis', a scriptural epic; 'Pindarique Odes'.
**Cowpea,** a bean-like plant, **910, 347.**
**Cow'pens,** S.C., town 9 mi. n.e. of Spartanburg; British defeated by Americans (1781), **3292.**
**Cowper, William** (1731–1800), Eng. poet, author of 'John Gilpin', **910–1, 1166.**
**Cowpox,** a mild form of smallpox, **3613.**
**Cowrie Islands.** Same as **Maldive Islands.**
**Cowry** or **cowrie,** a genus of mollusks, **3945;** shells used as money, **3202, 2281;** "tiger," *picture,* **3203.**
**Cowslip,** flowering plant of primrose family, **911.**
**Cow trees,** or milk trees, of family *Urticaceae,* closely related to breadfruit, **3532, 3940.**
**Cox, David** (1783–1859). Eng. landscape painter, considered greatest Eng. watercolorist; in oil painting most important follower of Constable; his colors are rich and fresh; treatment of light and atmosphere extremely skilful.
**Cox, Jacob Dolson** (1828–1900), Amer. general and statesman, b. Montreal, maj.-gen. in Civil War, sec. of interior 1869–70; wrote much on Civil War; **911.**
**Cox, James M.** (born 1870), Amer. political leader and journalist, b. Jacksonburg, Ohio; House of Representatives 1909–13; gov. of Ohio 1913–15, 1917–21; defeated for president, **1582.**
**Cox, Kenyon** (1856–1919), Amer. mural painter, **911–2, 2634.**
**Cox, Palmer** (born 1840). Amer. illustrator and author, b. Granby, Quebec; created "Brownies," series of humorous books, illustrated by himself, designed for children.
**Cox, Dr. Richard** (1500?–81), Protestant reformer, helped compile Book of Common Prayer; was equally intolerant of Puritans and Catholics; followers quarrel with Knoxians, **2937.**
**Cox'swain,** one who steers rowboat, **444,** *picture,* **445.**
**Coyote** (*kō-yō'tē* or *kī'ōt*), the prairie wolf, **3774, 3775.**
**Coy'pu rat,** largest of all rats, **2977, 2978;** nutria fur, **3036.**
**Crab,** a crustacean, **912–4;** coral crab, *picture,* **886;** evolutionary position, *diagram,* **128;** eye, *picture,* **1215;** foot, *picture,* **1323;** king crab, **1336,** *picture,* **913;** scientific classification, **3325, 3946;** Virginia fisheries, **3650.**
**Crab** or **Cancer,** a constellation, **3840,** *chart,* **873.**
**Crab-apple,** any variety of the small Siberian crab (*Pyrus baccata*), a close relative of the common apple; flowers, **3535.**
**Crabbe** (*krăb*), **George** (1754–1832). Eng. poet; 'Tales in Verse'; 'Parish Register'—little novels of homely realism in verse.
**Crab-spider, 3325.**
**Cracker industry, 500.**
**Cracker State, 3347.**
**Cracking process,** in petroleum refining, **2754.**
**Crack willow, 3743;** leaf, **3536.**
**Cracow** (*krä'kou*) or **Krakow,** city in s. Poland on Vistula R.; pop. 180,000; **914–5;** in Hanseatic League, **1576;** river trade, **3651.**
**Crad'dock, Charles Egbert.** *See in Index* **Murfree, Mary N.**
**Cradle,** a form of scythe, **3731.**
**Cradock, Sir Christopher** (1862–1914). Eng. admiral; commanded cruiser squadron which was defeated off Coronel, Chile, Nov. 1, 1914; went down with his ship, *Good Hope.*
**Craft gilds, 1459–60.**
**Craig, Edward Gordon** (born 1872). Eng. actor and author; son of Ellen Terry; founded school of theatrical art 1913 in Florence, Italy; designs stage settings, **3485.**
**Craig, Lieut.-Col. Sir James** (born 1871). Irish political leader; became prime minister of Northern Ireland 1921.
**Craigie** (*krā'gi*). **Pearl Mary Teresa.** *See in Index* **Hobbs, John Oliver.**
**Craigie House,** Cambridge, **588.**
**Craik, Dinah Maria.** *See in Index* **Mulock.**
**Craiova** (*krä-yō'vä*) or **Krajova.** Rumania. Trading and mfg. town 110 mi. w. of Bucharest; pop. 52,000.
**Crait** or **krait,** a snake, **1748, 3259.**
**Cram, Ralph Adams** (born 1863). Amer. architect and writer, b. Hampton Falls, N.H.; planned notable college buildings and churches ('The Gothic Quest').
**Cramp,** muscular, **2373.**
**Cram'pit,** in curling, **940.**

**Cranach** or **Kranach** (*krä'näĸ*), **Lucas** (1472–1553). Ger. painter and engraver; founder of Saxon school; friend of Luther; portraits of Luther and all Ger. reformers and princes of Reformation period; also painted scriptural and mythological subjects.
**Cranberry, 915, 1379;** chief producing centers, **2460, 2842, 3770;** related to blueberry, **439.**
**Crane, Ichabod,** in Washington Irving's 'Legend of Sleepy Hollow', a lank grotesque country schoolmaster, suitor of Katrina Van Tassel, **1239, 1831.**
**Crane, Stephen** (1870–1900). Amer. short-story writer and war correspondent, b. Newark, N.J. ('The Red Badge of Courage').
**Crane, Walter** (1845–1915). Eng. artist, craftsman, designer, social idealist, and writer; like William Morris in social creed and in devotion of art to everyday use of all classes of people.
**Crane,** bird, **915, 3362–5, 412;** courtship dancing, *picture,* **405;** migrating, *picture,* **3363.**
**Crane,** machine, **2189.**
**Crane's-bill,** or **wild geranium, 1435.**
**Craniom'etry, 149, 2956.**
**Cra'nium,** brain case of skull, **490;** possessed by vertebrates, **3634.**
**Crank shaft, automobile,** *picture,* **281.**
**Cran'mer, Thomas** (1489–1556), Eng. church reformer, archbishop of Canterbury; chief author of Eng. prayerbook still used; Bible translation, *picture,* **390;** divorces Henry VIII, **1636;** martyred, **2157.**
**Cranston,** R.I. Suburb of Providence; pop. 29,407; market gardening, dairying; cotton and iron goods.
**Crape** or **crêpe,** a gauzy fabric, either silk or cotton, **2199.**
**Crappie,** a fish, **3396, 1283.**
**Cras'sus, Marcus Licinius** (115?–53 B.C.), Rom. general and statesman; called "the rich" because of his immense wealth; supported Sulla against Marius; suppressed Spartacan uprising; in first triumvirate, **564.**
**Crater Lake,** Ore., **1957,** *picture,* **2401.**
**Crater Lake National Park,** in Cascade Mts., s.w. Oregon; 159,360 acres; contains Crater L.; **2400.**
**Craters,** of moon, **2318, 2321, 2322,** *picture,* **2319;** of volcano, **3657–8,** *pictures,* **3658, 3659, 3660.**
**Crawfish,** a fresh-water crustacean, **915–7;** compared with crabs, **912;** evolutionary position, *diagram.* **128;** length of life, **126;** story, 'What the Crawfishes Had to Say for Themselves', **916–7.**
**Crawford, F. Marion** (1854–1909). Amer. novelist, b. and lived much in Italy; 'Mr. Isaacs', story of Anglo-Indian life; later novels, as 'Saracinesca' series, almost exclusively Ital. in subject and setting.
**Crawford, William H.** (1772–1834), Amer. statesman, b. Nelson County, Va.; presidential candidate (1824), **785.**
**Crawfordsville,** Ind., trade center of agricultural region, 44 mi. n.w. of Indianapolis; pop. 10,139; matches and other mfrs.; Wabash College; **1762.**
**Crawley, Sir Pitt.** Vulgar miserly old baronet in Thackeray's 'Vanity Fair'.
**Crawl stroke, 3410.**
**Crayfish.** Same as **Crawfish.**
**Crayon, 685.**
**Cream, 952;** food value, **1320, 1321.**
**"Cream City," 2246.**
**Cream of tartar, 3438, 305, 1502.**
**Cream separator, 950, 682.**
**Creasy** (*krē'si*), **Sir Edward S.** (1812–78). Eng. historian, chief justice of Ceylon ('Fifteen Decisive Battles of the World').
**Creation,** in Gk. myth., **3607.**
**Crécy** (*krā-sē'*), France, village 100 mi. n.w. of Paris; battle of (1346), **1699, 635, 1552, 1700,** *picture,* **1699.**
**Credit, 917–8, 327.**
**Crédit Mobilier** (*krā-dē' mō-bē-yā'*) **of America,** corporation organized to finance and construct Union Pacific R.R.; operations led to greatest scandal in U.S. political history; **1499.**
**Credits,** in bookkeeping, **5.**
**Creeks,** confederation of Indian tribes originally living in Ala. and Ga., **1766, 70,** *picture,* **1774;** wars in Ala., **73, 1772, 922;** moved to Indian Territory, **2576, 1434, 1772.**
**Creel, George** (born 1876), Amer. journalist, b. Blackburn, Mo.; chairman Committee on Public Information (1917–19) during World War, **3748.**
**Creeper,** an insect-eating bird, **2544, 412;** brown, *picture,* **419;** egg, *picture,* **1091.**
**Creeper** or **Virginia creeper,** a vine, **3651, 1854.**
**Crees** (*krēz*), tribe of Plains Indians living mainly about L. Winnipeg and Saskatchewan R., **1767, 3129.**
**Cre'feld.** Same as **Krefeld.**
**Creighton** (*krā'tŏn*), **Mandell** (1843–1901). Eng. clergyman and historian ('The Age of Elizabeth'; 'History of the Papacy').
**Creighton University.** At Omaha, Neb.; men; Cath. (Jesuit); founded 1879; arts and sciences, medicine, law, pharmacy, dentistry.
**Cremo'na,** Italy, city 48 mi. s.e. of Milan on Po R.; pop. 43,000; famous for 16th-cent. school of painting; violins, **3646.**
**Creole** (*krē'ōl*), name used in s. U.S. and Latin Amer. for pure-blooded descendants of early French, Spanish, or Portuguese settlers; incorrectly used for a mulatto; in New Orleans, **2470.**
**Cre'olin,** antiseptic derived from coal-tar, **814.**
**Creon** (*krē'ŏn'*), in Gk. myth., king of Thebes, uncle of Antigone, **2566.**
**Creosote** (*krē'ō-sōt'*), antiseptic oil containing cresol and guaiacol, distilled from beechwood, **918, 365.**
**Creosote oil,** distillate of coal-tar containing cresol, phenol, naphthalene, and anthracene, **918, 814, 151.**
**Crêpe.** Same as **Crape.**
**"Crescent City," 2468.**
**Cre'sol,** antiseptic distilled from wood or coal-tar, **814.**
**Cress,** plant of mustard family, **553–4.**
**Crested auk, 259,** *picture,* **258.**
**Creta'ceous period,** in geology, **1418, 1420;** *picture,* **1419.**
**Crete** (*krēt*), Gk. isl. in Mediterranean; 3330 sq. mi.; pop. 344,000; **918–9,** *maps,* **27, 1196-7;** annexed to Greece, **1526, 3625;** early civilization, **27–9;** in Gk. myth., **3487, 949.** *See also in Index* **Aegean Civilization.**
**Crete,** Neb. City 20 mi. s.w. of Lincoln; pop. 2500; Doane Univ.
**Cre'tin,** a type of subnormal dwarf, **1469.**
**Cretonne'.** A printed cotton fabric, usually thick and strong, woven in a ridged or other figure; it is used for curtains and furniture covers, but unlike chintz, is rarely glazed or calendered; originally it was a white cloth produced in France and named for its manufacturer.
**Creusot** (*krû-sō'*), **Le,** town in e.-cent. France, 75 mi. n.w. of Lyons; pop. 35,000; **1348.**
**Crevasse** (*krĕ-văs'*), in glaciers, **1466.**
**Crewe, Robert O. A. Crewe-Milnes,** first **Marquis of** (born 1858). Eng. statesman, Liberal leader in House of Lords; lord-lieut. **of Ireland** 1892–95; lord-pres. of the council 1905–08, 1915–16; sec. **of state for the colonies** 1908–10, **for India** 1910–15.
**Crewe,** England. Important r.r. town 30 mi. s.e. of Liverpool; pop. 50,000; locomotives, rails, and rolling stock.
**Cribel'lum,** of spider, **3326.**
**Crichton** (*krī'tŏn*), **James** (1560?–82?), "The Admirable Crichton." Scotch scholar, adventurer, and swordsman of proverbial versatility; said to have been master of 12 languages at 17, and to have "run through" the whole circle of the sciences at 20; killed in a street brawl.
**Cricket,** game, **919–21.**
**Cricket,** insect, **921, 1788;** ear, **1787;** mole, *pictures,* **921, 1784;** young, **1786.**
**'Cricket on the Hearth',** story by Dickens, **921.**
**Cri'coid cartilage,** *picture,* **2083.**
**Crimea** (*krī-mē'ā*), peninsula jutting southward from Russia into the Black Sea; 9700 sq. mi.; pop. 855,000; **921–2.**
**Crime and criminals:** finger-print identification, **1247;** courts of justice, **909–10, 1906;** police, **2865–8;** prisons and punishments, **2918–20;** trials, **1903–5.**
**Crimean War** (1853–56), **922, 310;** Napoleon III, **2397;** Florence Nightingale's work, **2509;** Russell, **3084;** Russia, **3090, 2505–6;** Turkey, **3560.**
**Crimson clover, 810.**
**Crin'oid** or **sea lily,** an echinoderm animal, **3945;** early type of sea life, **1418.**
**Crin'oline,** or hoop skirt, **900.**
**Cripple Creek,** Colo., center of Colo. gold-mining dist. where more than $300,000,000 worth of ore was mined between 1891–1915; pop. in 1900, 10,147; in 1920, 2325; **844.**
**Crisana** (*krēsh-ä'nä*). Dist. in w. Rumania, formerly Hungarian; 8038 sq. mi.; pop. 1,317,000.
**Crisfield,** Md., city 100 mi. s.e. **of** Baltimore on Tangier Sound; pop. 4116; oyster industry, **2160.**
**Crispi** (*krēs'pē*), **Francesco** (1819–1901). Ital. statesman, one of makers of modern Italy, aide of Mazzini and Garibaldi; premier 1887–91, 1891–96; strong supporter of Triple Alliance.
**Cris'pin, Saint.** Christian martyr of late 3d cent.; patron saint of shoemakers.
**Cristobal',** port of Canal Zone, **2662.**
**Cristofori** (*krēs-tō-fō'rē*), **Bartolommeo** (1655–1731), Ital. harpsichord maker; invented piano, **2797.**
**Critical Period,** in U.S. history, **3602, 3593.**
**Crit'tenden, John J.** (1787–1863). U.S. senator, b. Woodford County, Ky.; author Crittenden Compromise; helped secure Ky. for Union in Civil War.
**Crittenden Compromise.** Constitutional amendment proposed by Senator J. J. Crittenden (1860–61) in attempt to avert Civil War; prohibited slavery n. of 36° 30′ and provided adequate protection for Southern slave-holder; defeated.
**Croatia-Slavo'nia** (*krō-ā'shĭ-ä*), constituent part of Jugo-Slavia, formerly autonomous province of Hungary; cap. Zagreb; 17,400 sq. mi.; pop 2,715,000; **271–2, 1286, 1901, 1902,** *maps.* **271, 308.**
**Cro'ats,** people, **1901–2, 3250.**
**Croce** (*krō'chā*), **Benedetto** (born 1866). Ital. philosopher; wide influence on modern idealistic philosophy and esthetics ('Philosophy of the Spirit').
**Crochet** (*krō-shā'*), **lace, 1950.**
**Crockery.** *See in Index* **Pottery.**
**Crock'ett, David** (1786–1836), Amer. pioneer, **922;** at the Alamo, **3478.**

**Crockett, Samuel Rutherford** (1860–1914). Scotch novelist ('The Stickit Minister'; 'The Raiders'; 'The Men of the Moss-Hags').
**Crocodile** (*krŏk'ō-dīl*), **922–3**; in Abyssinia, **4**; alligator distinguished, **98**; care of eggs, **131**; classified, **2997**; egg, *picture*, **1091**; evolutionary position, *diagram*, **128**; in India, **1748**; teeth, **3452**; venerated in Egypt, **1106**.
**Crocodile bird,** *picture*, **922**.
**Cro'cus,** plant of the iris family, **923**; bulb structure, **532**.
**Croesus** (*krē'sŭs*), king of Lydia 560–546 B.C., **923, 30**.
**Croix de Guerre** (*krwä dē gêr*), **979**, *picture*, **977**.
**Cro'ker, Richard** (1843–1922). Amer. politician, b. in Ireland; as leader of Tammany Hall (1886–1900) unofficial dictator of New York City; won Eng. Derby in 1907.
**Cro'ly, Jane Cunningham** (1831–1901) ("Jennie June"), Amer. writer and club woman, b. in England, **3777**.
**Cro-Magnon** (*krō-mä-nyoṅ'*), race of Stone Age men, **666, 668, 2133**.
**Crome** (*krōm*), **John** (1768–1821). Eng. landscape painter and etcher.
**Cro'mer, Evelyn Baring, Earl of** (1841–1917). Brit. statesman and diplomatist; as Brit. agent 1883–1907 directed and reorganized Egyptian govt.; called maker of modern Egypt; free trade Unionist leader in House of Lords 1907–17 ('Modern Egypt'; 'Abbas II').
**Crom'lechs, 3361**.
**Crompton, Samuel** (1753–1827), inventor of spinning mule, **923–4**.
**Cromwell, Oliver** (1599–1658), Eng. Puritan soldier and statesman, Lord Protector of the Commonwealth, **924–6, 693, 694**; Barebone's Parliament, **2689**; commissions Blake admiral, *picture*, **1153**; Hampden aids, **1570**; Ireland subdued, **1808**; Milton, **2242**; Scotland conquered, **3149**.
**Cromwell, Richard** (1626–1712), son of Oliver Cromwell and Lord Protector (Sept. 1658—May 1659), **925**.
**Cromwell, Thomas** (1485–1540), Earl of Essex, Eng. statesman; confidential servant to Cardinal Wolsey and agent of Henry VIII in effecting Eng. Reformation; called "hammer of the monks"; **1636**; *picture*, **390**.
**Cronje** (*krŏn'yĕ*), **Piet** (1840?–1911), Boer general; captured Jameson raiders; surrender, **447**.
**Cronos.** Same as **Kronos**.
**Cronstadt.** Same as **Kronstadt**.
**Crook, George** (1828–90). Civil War general, b. near Dayton, Ohio; subdued w. Indian tribes 1866–83, was given charge of them, and encouraged them to become self-supporting.
**Crookes, Sir William** (1832–1919), Eng. chemist and physicist; invented Crookes tube, **3824**; radium, **2960**; spinthariscope, **2958**.
**Crookes tube, 3824,** *picture*, **3825**.
**Crookneck squash, 3333**.
**Crop.** The first of a bird's three stomachs; stores food and prepares it for digestion by the other two; largest in grain-eating birds and missing in fruit and insect eaters.
**Crop rotation, 2512, 48**; alfalfa, **89**; clover, **809–10**; insect pests checked, **3331**; root crops, **1778**; rusts and smuts, **3101**.
**Crops.** *See in Index* **Agriculture; Cereal crops; Forage crops; Gardens and gardening; Fruit growing; Root crops**.
**Croquet** (*krō-kā'*), game, **926**.
**Crore** (*krōr*), **1752**.
**Crosby, Fanny** (Frances Jane Van Alstyne) (1820–1915). Amer. hymn-writer, b. Southeast, N.Y., blind from infancy; wrote 'Safe in the Arms of Jesus', 'Rescue the Perishing', and thousands of other hymns.
**Cross,** in biology. *See in Index* **Hybrid**.
**Cross,** Celtic, *picture*, **1808**.
**Crosbill,** a type of finch, **1241**.
**Crossbow,** in medieval warfare, **1935, 214, 1699, 42**.
**Cross Keys,** Va. Village 19 mi. n.e. of Staunton, Va.; indecisive battle (1862) in Civil War.
**Cross-pollination, 1304**.
**Cross-staff,** for determining latitude, **2422**.
**Cro'talus,** the rattlesnake genus of snakes, **2978**.
**Croto'na,** anc. name of Cotrone, Italy; Pythagoreans at, **2941**.
**Cro'ton Aqueduct, 164;** *picture*, **3702**.
**Croton bug,** a cockroach, **818**.
**Croton Dam,** N.Y., *picture*, **2486**.
**Croton oil,** purgative drug obtained from a plant of the spurge family; poisonous, **2855**.
**Croup,** treatment of, **1269**.
**Crow, 926–9,** *pictures*, **2676, 403**; altitude range, **397**; care as pet, **2758**; intelligent behavior, **131, 927**; nest, **406**; related to birds of paradise, **2676**; 'The True Story of Jimmie, a Tame Crow', **927–9**.
**Crow-bird, a purple grackle, 432–3**.
**Crowd'er, Enoch H.** (born 1859). Major-general and judge advocate general U.S. Army; graduated U.S. Military Academy, 1881, U. of Missouri (LL.B.) 1886; provost marshal general, U.S. Army, 1917–19.
**Crow family** or *Corvidae*, **412, 926**; includes jays, **440**; magpies, jackdaws, and rooks, **212**; diamonds, **2979**.
**Crowfoot family** or *Ranunculaceae*, **3941**; includes buttercups, **544**; clematis, **786**; columbine, **846**; hepatica, **1639**; larkspur, **1963**.
**Crow Indians,** tribe of Plains Indians formerly living about headwaters of Yellowstone R., **1767**.
**Crown.** An Eng. silver coin, the equivalent of 5 shillings; worth about $1.20 in U.S. money.
**Crown,** or keystone, of arch, **174**.
**Crown,** of tooth, **3452**.
**Crown,** size of paper, **2673**.
**Crown colonies,** in Brit. Empire, **514**.
**Crown glass, 1472**.
**Crown jewels** (Gt. Brit.), **2050**.
**Crown Point,** N.Y. Village on L. Champlain 90 mi. n. of Albany; pop. 1413; Brit. fort, captured (1775) by Seth Warner.
**Crow's nest,** of ship, *picture*, **2420**.
**Croy'don,** England. Residential suburb 10 mi. s. of London; pop. 192,000; r.r. center; once residence of Archbishop of Canterbury.
**Cru'cible,** in glass-making, **1471**; in steel-making, **1824**.
**Crucif'erae** or *Brassicaceae*, cabbage or mustard family, including radishes and turnips, **554–5**.
**Crucifix'ion,** of Jesus Christ, **1888**.
**Cruikshank** (*krŭk'shănk*), **George** (1792–1878). Eng. caricaturist, etcher, and illustrator.
**Cruis'ers,** in modern navies, **2423**.
**Crusades** (*krū-sādz'*), **929–32, 3624-5**; First, **929–30**; Second, **930,** *picture*, **931**; Third, **930, 3015, 3111–2, 947, 1358**; Fourth, **932, 552, 3625, 918**; Fifth, **932, 1358**; Sixth and Seventh, **932, 2065,** *picture*, **2064**; Albigensian, **2762**; Hussite, **1705**. —*Effects on Europe*, **932, 551**; Arabic notation, **2543**; architecture, **181–2**; dyeing, **1050**; flags, **1287**; new plants introduced, **2278, 1674**; sugar, **3385**.
**Crusading orders, 932, 2131**.
**Crusoe** (*krū'sō*), **Robinson,** hero of novel by Defoe, **933–4, 986**.
**Crusta'cea,** class of heavily armored arthropod animals, **3325, 3946**; distinguished from mollusks, **2280**; evolutionary position, *diagram*, **128**; includes barnacle, **331**, crab, **912–4**, crawfish, **915–7**, lobster, **2041–2**, shrimp, **3225**.
**Cry'olite,** mineral containing sodium, aluminum, and fluorine; mined in Greenland, **1540**.
**Cryp'togams,** plant group, including all spore-reproducing types, **3173**.
**Crystal detector,** in wireless, **3761**.
**Crystal glass, 1472**.
**Crys'talline lens,** of eye, **1214**.
**Crystalliza'tion** of metals, **279, 935**.
**Crystallog'raphy,** science of crystals, **935**.
**Crystal Palace,** building of iron and glass erected in Hyde Park, London, for great exhibition of 1851; reërected at Sydenham, near London, and opened 1854; used for exhibits, concerts, athletic games, etc.; **1220**.
**Crystals, 935**; diamonds, **1002**; frost, **1375–6**; ice, **1720**; snow, **3262**.
**Ctesiphon** (*tĕs'i-fŏn*). Anc. city of Babylonia, on Tigris, 45 mi. n.e. of Babylon; cap. of Parthian kingdom.
**Cu'ba,** largest and richest isl. of W. Indies; 44,200 sq. mi.; pop. 2,900,000; **936–8,** *maps*, **938, 2514–5**; cap. Havana, **1598, 1600**; climate and surface, **936**; discovery, **849**; foreign trade, **1600, 937**; products and resources, **936–7**; sugar, **3385, 936**; tobacco, **3509, 936,** *picture*, **937**; yellow fever, **3144–5**. —*History*, **937–8**; Ostend Manifesto, **2802**; Span.-Amer. War, **3306–7**.
**Cube,** in geometry, **1425**.
**Cubic measure, 3715**.
**"Cubists,"** in painting, **2633–4**; in sculpture, **3164**.
**Cu'bit,** a unit of measure, **3713**.
**Cuchulain** (*kų-kų'lĭn*), legendary Irish hero, **1814**.
**Cuckoo** (*kųk'o͞o*). European bird noted for laying eggs in nests of others, **939,** *picture*, **417**; altitude range, **397**; eats caterpillars, **662, 402, 939**.
**Cuckoo clock, 798**.
**Cucujo** (*kū'kū-jō*), a S. Amer. firefly, **1263**.
**Cu'cumber,** 939; food value, **1321**; when and how to plant, **1397**.
**Cucumber, sea, 3165**.
**Cucumber tree,** a magnolia, **2123**.
**Cucurbitaceae** (*kū-kûr'bĭ-tā-sē-ē*), plant family including cucumbers, **939,** gourds, **1492,** melons, **2196,** squashes and pumpkins, **3333**.
**Cud-chewing animals, 3082–3, 663**. pop. 57,000; **1746**.
**Cuddalore',** India, seaport on Bay of Bengal, 100 mi. s.w. of Madras; pop. 57,000; **1746**.
**Cudweed, 1740**.
**Cudworth, Ralph** (1617–88). Eng. philosopher, one of Cambridge Platonists ('True Intellectual System of the Universe'; 'Treatise on Eternal and Immutable Mortality').
**Cue,** billiards, **392–3**.
**Cuenca** (*kwĕn'kä*). Third city of Ecuador in s.w.; pop. 50,000; mfg. and trade center.
**Cugnot** (*kų-ñyō'*), **Nicholas Joseph** (1725–1803), Fr. inventor, **276**.
**Cuirass** (*kwē-răs'*), **214**.
**Cuirassiers** (*kwē-rà-sērz'*), French troops, *picture*, **1352**.
**Culebra** (*kų-lā'brä*) or **Gaillard Cut, 2663,** *picture*, **2656**.
**Culex** (*kū'lĕks*), a genus of mosquitoes, **2336**.
**Cul'linan diamond, 1005**.
**Cullo'den Moor,** famous Scotch battlefield in Inverness-shire near Moray Firth; battle of (1746), **2915**.
**Culver,** Ind. Town in n., 32 mi. s.w. of South Bend; pop. 1080; Culver Military Academy.
**Cumae** (*kū'mē*). Anc. city on coast of Campania, w. Italy; oldest Gk. colony in Italy; supposed home of Cumaean sibyl.

**Cumaean Sibyl,** 3229.
**Cumara** (*kụ'mȧ-rȧ*) **nut** or **tonka bean,** 2546, 3619.
**Cumarin.** Same as **Coumarin.**
**Cum'berland, William Augustus, Duke of** (1721–65), third son of George II of England; commanded at Culloden Moor, **2915.**
**Cumberland,** extreme n.w. county of England; 1520 sq. mi.; pop. 272,000; includes part of Lake District; coal, iron, lead; county seat Carlisle; **1160.**
**Cumberland,** Md., city in n.w.; pop. 29,837; on Potomac R. and terminus of Chesapeake and Ohio Canal; ships coal; makes iron and steel, auto tires, glass, brick; site of old Ft. Cumberland, built in 1754; **2162;** end of National Pike, **3024.**
**Cumberland,** R.I. Town 6 mi. n. of Providence; pop. 10,077; cotton goods, silk, iron, etc.; mineral region; many points of historic interest; named for William Augustus, Duke of Cumberland.
**'Cumberland',** U.S. warship, **2287.**
**Cumberland Gap,** gorge through Cumberland Mts., where Ky., Va., and Tenn. meet; 500 ft. deep; strategic point in Civil War; discovered, **1919;** early route west, **1916, 1920, 464, 3581–2.**
**Cumberland Plateau** or **Mountains,** the westernmost of three great divisions of Appalachian system; in Ala., **70;** caves, **666;** coal mine, *picture,* **1919;** deforested by early settlers, **3583;** in Ky., **1916, 1919;** Tenn., **3465, 3466;** W. Va., **3720.**
**Cumberland River,** tributary of the Ohio R., flowing through Ky. and Tenn., **3466, 2398, 2573,** *map,* **3468.**
**Cumberland Road** or **Great National Pike,** finished 1840; once chief route for western emigration; **3024, 1762.**
**Cum'brian Mts.,** in n.w. England, part of Cumberland, Westmoreland, and Lancashire; joined to Pennine Range by Sca Fell (3210 ft.), highest mountain in England; Lake District, **1160,** *picture,* **1158.**
**Cum'in,** spice from a plant of the parsley family, **3319, 3317.**
**Cum'mins, Albert Baird** (born 1850). Amer. statesman, b. Carmichaels, Pa.; gov. of Iowa 1902–8; U.S. senator since 1908; advocate of legislation for control of railroads and other corporations; joint author with J. J. Esch of Esch-Cummins law.
**Cumulative preferred stock,** 3358.
**Cumulus** (*kū'mū-lŭs*) **clouds,** 809, *picture,* **808.**
**Cunae'us,** Dutch physicist; invented Leyden jar, **1118.**
**Cunard** (*kū-närd'*), **Sir Samuel, Bart.** (1787–1865). Eng. ship-owner, b. Nova Scotia; founded (1839) Cunard steamship line.
**Cunard Line, 3210, 3212, 3218.**
**Cunaxa** (*kū-năx'ȧ*). Plains in Mesopotamia, on Euphrates R., 60 mi. n. of Babylon; defeat and death of Cyrus the Younger in battle against his brother Artaxerxes Mnemon 401 B.C.
**Cuncta'tor** ("The delayer"), nickname of Quintus Fabius Maximus, **1575.**
**Cuneiform** (*kū'nē-ĭ-fôrm*) **writing,** anc. system of writing used by Babylonians, Assyrians, and Persians, **939, 3816–7, 294,** *pictures,* **297;** Persian Behistun Rock, *picture,* **2739.**
**Cuneo** (*kụ-nā'ō*), Italy. Town in Piedmont, 50 mi. s. of Turin; pop. 30,000; name ("wedge") from position between Stura and Gesso rivers; grain, silk, hemp, paper.
**Cup coral,** a variety of coral polyp, *picture,* **885.**
**Cupella'tion,** a process in assaying ores, **236.**
**Cupid** (*kū'pĭd*), in Rom. myth., same as Gk. Eros; god of love, son of Venus, usually represented as boy armed with bow and arrows, **939–40, 155.**
**Cupid and Psyche** (*sī'kē*), **939–40.**
**Cu'pola furnace, 1382.**
**Curaçao** (*kụ-rä-sȧ'ō*) or **Curaçoa.** Isl. in Dutch W. Indies; 212 sq. mi.; pop. 34,000; exports salt, phosphate; peculiar variety of oranges used in Dutch liqueur Curaçao; colony of Curaçao also includes neighboring isls.; total area, 403 sq. mi.; pop. 54,000.
**Curare** (*kụ-rä'rā*), a poison, **3372.**
**Curas'sow** or **Curaçao bird.** A large turkey-like bird of S. and Cent. Amer., easily domesticated and resembling in habits domestic poultry.
**Curb market,** in New York, **3360.**
**Curculionidae** (*kûr-kū-lī-ŏn'ĭ-dī*) or **snout beetles, 3713.**
**Curd** of milk, **1011, 709.**
**Cur'few, 379;** in medieval Flanders, **373.**
**Curia Regis** (*kū'rĭ-ȧ rē'ĝĭs*) (Latin, "king's court"), instituted by William the Conqueror as the supreme central judicial body of England; ceased to function 1268; under Henry I and II, **1633.**
**Curia Romana** (*rō-mā'nȧ*), collective body of administrative organizations, which aid the pope in governing Rom. Cath. church, **2665–6.**
**Curiatii** (*kū-rĭ-ā'shĭ-ī*), in Rom. legend, three brothers of Alba Longa who fought their three cousins, the Horatii, **3041.**
**Curie** (*kü-rē'*), **Marie Sklodowska** (born 1867), Fr. physicist, b. in Warsaw, Poland; professor of physics at the Sorbonne, Paris; joint discoverer with her husband, Pierre Curie (1859–1909), of radium and polonium, **2959;** Nobel prize, **2513.**
**Curitiba** (*kụ-rē-tē'bȧ*), Brazil. Cap. of state of Parana in s.; pop. 50,000; r.r. connection with port Paranagua 68 mi. e.; exports corn, beef, tobacco, yerba maté; medical school.
**Cur'lew,** a shore bird of the snipe family, **3261, 414.**
**Curling,** a game, **940,** *picture,* **3755.**
**Curly maple, 2138.**
**Cur'ran, John Philpot** (1750–1817). Irish lawyer, patriot, and orator; defended Wolfe Tone and other Irish rebels of 1798; bitterly opposed union with Gt. Brit.
**Currant,** fruit of bush related to gooseberry, **940;** bush harbors rust, **3099;** in Greece, **1527.**
**Currency.** *See in Index* **Coins and coinage; Money; Paper money.**
**Currency, Comptroller of,** U. S., **3598.**
**Current, electric,** flow of electricity along a conductor, **1108–10, 1112–4;** alternating and direct, **1114, 1052, 1125;** primary cells, **1112–3,** *pictures,* **1109;** dynamos, **1050–2;** electrolysis, **1125;** galvanometers, **1392;** in lights, **1123;** magnetic effects, **1121, 2123, 1124–5;** measured in amperes, **1116;** motors, **1124–5;** silver best conductor, **3242;** street railways, **3371, 1125;** transfers photographs, **3174;** transformers, **3523–4.** *See also in Index* **Electricity.**
**Currents, air.** *See in Index* **Winds.**
**Currents, ocean, 2558–9;** in Atlantic, **255, 1549;** Gulf Stream, **1549;** Japan current, **2558, 77, 581;** Labrador current, **255, 1316.** *See also in Index* **Tide.**
**Cur'rie, Gen. Sir Arthur William** (born 1875), Canadian general in World War, **940–1.**
**Curry,** a spiced condiment, **3319.**
**Curtin, Andrew Gregg** (1815–94). Governor of Pa. 1860–66, one of best-known "war governors"; minister to Russia 1869–72; in House of Representatives as Democrat 1881–87.
**Curtis, Cyrus H. K.** (born 1850). Amer. newspaper and magazine publisher; controls *Saturday Evening Post, Ladies' Home Journal, Country Gentleman, Philadelphia Public Ledger.*
**Curtis, George Ticknor** (1812–94). Amer. lawyer and writer on U.S. constitutional law; was counsel in Dred Scott, legal tender, and other famous cases; wrote lives of Daniel Webster, James Buchanan, 'Constitutional History of the United States'.
**Curtis, George William** (1824–92). Amer. essayist and journalist, b. Providence, R.I.; many years editor of *Harper's Weekly;* strong advocate of civil service reform; wrote 'Nile Notes of a Howadji'; 'The Potiphar Papers', a satire on New York life; 'Prue and I', his most popular book.
**Curtiss, Glenn H.** (born 1878), Amer. inventor and pioneer aviator, b. Hammondsport, N.Y.; designer of many flying craft and flying boat types; inventor of hydroplane, *picture,* **57.**
**Curtis turbine, 3554.**
**Curtius** (*kur'tsĭ-ụs*), **Ernst,** (1814–96). Ger. archeologist, scholar, and historian ('History of Greece').
**Curve,** in baseball, how to pitch, **340.**
**Curzola** (*kụr-dzō'lä*), isl. of Jugo-Slavia in Adriatic off coast of Dalmatia; 107 sq. mi.; pop. 30,000; boat-building, fishing; *map,* **1836.**
**Curzon** (*kûr'zŏn*) **of Kedleston, George Nathaniel Curzon, first Earl** (born 1859). Brit. Conservative statesman, gov.-gen. of India 1899–1905; various posts in Lloyd George cabinet; wrote several books on problems of the Far East.
**Cus'cus,** opossum-like animal, **1908.**
**Cush'ing, Caleb** (1800–79), Amer. diplomat, b. Salisbury, Mass.; first Amer. minister to China; negotiated 1844 treaty defining rights of foreigners; one of three Amer. arbitrators of *Alabama* claims; minister to Spain 1874–77; atty.-gen., **2802.**
**Cushing, Frank H.** (1857–1900). Amer. ethnologist and author, b. Northeast, Pa.; resided among Zuñi Indians and adopted into tribe; leading authority on habits, folklore, and language of Pueblo Indians of s.w.
**Cushman, Charlotte** (1816–76). Amer. tragic actress, b. Boston, called greatest Lady Macbeth of her age; also played Meg Merrilies in 'Guy Mannering' and many other parts; a great actress and noble woman.
**Custard apple,** a tropical fruit, **1378.**
**Custer, George Armstrong** (1839–76), Amer. Civil War general, b. New Rumley, Ohio; killed by Sioux and whole command wiped out at Little Big Horn R., Mont., **1773, 2312, 3822, 3296.**
**Custis, Martha.** *See in Index* **Washington, Martha Custis.**
**Custis, Mary Randolph, 1982.**
**Customs Bureau,** U.S., **3598.**
**Customs duty.** *See in Index* **Tariff.**
**Custozza** (*kụs-tōd'zä*), Italy, village 11 mi. s.w. of Verona; Italians defeated by Austrians in 1848; also in 1866, **1837.**
**Cutch** or **Kutch.** Native state in n.w. of Bombay presidency; 7616 sq. mi.; pop. 515,000; cap. Bhaj.
**Cut glass, 1472.**
**Cuthbert, Saint** (d. 687). Eng. bishop, hermit, and missionary; life by Bede.
**Cu'ticle** or **epidermis, 3245–6.**
**Cutlass,** a form of sword, **3423.**
**Cutler, Manasseh** (1742–1823). Amer. clergyman, b. Killingly, Conn.;

leading organizer of Ohio Co., and drafter of Ordinance of 1787.
**Cutlery, 1937**; Conn., **863**; Birmingham, England, **427**; Sheffield, **3200**; steel, **1824**.
**Cuts,** first aid for, **1269–70**.
**Cuttlebone, 941, 2280**.
**Cuttlefish,** a ten-armed cephalopod mollusk, **941–2, 2280**; eggs, *picture*, **1091**; sepia, **1779–80**; skeleton, **3244**.
**Cutworm,** caterpillar which eats off plant stems at the ground, **944, 548**.
**Cuvier** (*kü-vyā'*), **Georges, Baron** (1769–1832), Fr. naturalist, pioneer in palcontology, and founder of comparative anatomy, **121, 3841**.
**Cuxhaven** (*kụks'häfn*), Germany, free port and watering place on North Sea; pop. 15,000; **1107, 1568**.
**Cuyahoga** (*kī-ȧ-hō'gȧ*) **Falls,** Ohio. Mfg. village 28 mi. s. of Cleveland, on Cuyahoga R.; pop. 10,200; paper bags, wire nails.
**Cuyahoga River,** in n. Ohio, 90 mi. long, emptying into L. Erie at Clcveland, **792**.
**Cuyp** (*koip*), **Albert** (1620–91), Dutch landscape painter, **2631**.
**Cuyu'na Range,** iron range in Minn., **2254**.
**Cuza** (*kụ'zȧ*), **Alexander John** (1820–73). First prince of Rumania (1859–66); despotic methods led to forced abdication.
**Cuzco** (*kụs'kō*), Peru, mfg. and trade city in s., 11,380 ft. above sea level; pop. 15,000; university; anc. cap. empire of Incas, **1741, 2744**.
**Cyanamide** (*sī-ăn-ăm'id*), compound containing cyanogen, nitrogen, and sometimes another element; of calcium, **571, 2512**.
**Cyanide** (*sī'ȧ-nīd*), a salt of hydrocyanic acid, **944**; poisonous properties, **2855**.
**Cyanide process** of reducing ores, **1480, 944**.
**Cyanogen** (*sī-ăn'ō-ġĕn*). A poisonous gas ($C_2H_2$) with almond-like odor.
**Cyaxares** (*sī-ăks'ȧ-rēz*). King of Medea about 624–584 B.C.; founder of Median empire; destroyed Nineveh 606 B.C.
**Cybele** (*sīb'ē-lē*), the "Great Mother of the Gods," Asiatic goddess identified by Romans with Rhea, mother of Jupiter; her worship became one of the three great cults under Rom. Empire; **248**.
**Cycad** (*sī'kăd*), a gymnosperm tree, **3533**.
**Cyclades** (*sĭk'lȧ-dēz*), group of Gk. isls. in Aegean Sea, s.e. of Greece, **1520,** *map*, **1518**.
**Cycle** (*sī'kl*), a series of events which repeats itself; in electricity, **1114, 1052**; "four-cycle" and "two-cycle" engines, **1404–6**.
**Cy'clone, 944, 3366**; rainfall, **2973**.
**Cyclops** (*sī'klŏps*), in Gk. myth., a race of one-eyed giants, **944, 1639, 3607**; story, 'How Odysseus and His Men Outwitted the Cyclops', **944–5**.
**Cygnet** (*sĭġ'nĕt*), a young swan, **3399**.
**Cygnus** (*sĭġ'nŭs*) or **Swan,** a constellation, across the Pole Star from the Great Bear; nebula, **2432**.
**Cyl'inder,** in gas engine, **1404–5, 280, 281, 282**.
**Cylinder press, 2916**.
**Cym'bals,** pair of plate-like musical instruments played by clashing together, **2383, 2591,** *picture*, **2382**.
**Cymbeline** (*sĭm'bĕ-lēn*) or **Cunobeline.** Brit. king of first cent. A.D., whose half-mythical history is used by Shakespeare as a basis for his drama 'Cymbeline'.
**Cynics** (*sĭn'ĭks*), school of anc. philosophers, forerunners of the Stoics, **1011**.
**Cynoscephalae** (*sĭn-ŏs-sĕf'ȧ-lē*), **battle of** (197 B.C.), **1525**.
**Cynosure** (*sī'nō-shụr*). The constellation of Little Bear, which contains the Pole Star; hence, an object to which general attention is directed.
**Cy'press,** conifer tree yielding durable timber, **946**; distinguished from other conifers, **3539**; in Fla., **1295**; in La., **2070**; in Miss., **2068**; roots, **2828**.
**Cyprian** (*sĭp'rĭ-ȧn*), **Saint** (200?–258), a leader of African church, converted to Christianity in middle life; became bishop of Carthage 248; beheaded by order of Emperor Valerian; **3549**.
**Cyprus** (*sī'prŭs*), Brit. isl. in Mediterranean; 3584 sq. mi.; pop. 310,000; **947,** *map*, **1196–7**; in myth., **155**.
**Cypselidae** (*sĭp-sĕl'ĭ-dē*), the swift family of birds, **3399**.
**Cyrano de Bergerac.** *See in Index* **Bergerac.**
**Cyrenaica** (*sī-rē-nā'ĭ-kȧ*), dist. in Ital. colony of Tripoli, **3541**.
**Cyrena'ic school** of philosophy, **3541**.
**Cyrene** (*sī-rē'nē*), anc. Gk. city, cap. of Cyrenaica, **3541**.
**Cyril** (*sĭr'ĭl*), **Saint** (376?–444 A.D.). Bishop of Alexandria noted for zeal against heretics; said to have instigated murder of Hypatia.
**Cyril, Saint** (827–869 A.D.). "The Apostle of the Slavs," to whom is attributed Cyrillic alphabet.
**Cyril'lic alphabet, 101, 338**; used by Russians. **3096,** by Serbs, **1901,** by Slavs, **3250**.
**Cyropedi'a,** work by Xenophon, **3823**.
**Cy'rus the Great** (600?–528 B.C.), founder of the Persian Empire, **2737, 2191**; conquers Lydia, **923**; restores Jews to Jerusalem, **1891**.
**Cyrus the Younger** (424?–401 B.C.), king of Persia, **3823**.
**Cythera** (*sĭ-thē'rȧ*). *See in Index* **Cerigo.**
**Cytol'ogy,** science of cell organism, **3935**.
**Cy'toplasm,** of cell, **2926**.
**Cyzicus** (*sĭz'ē-kŭs*). Anc. city of Mysia in w. Asia Minor on present peninsula of Kapu-Dagh; founded by Greeks.
**Czar** (*zär*), title of Rus. emperor; taken by Ivan IV, **1853**.
**"Czar Kolokol."** *See in Index* **Kolokol.**
**Czarniecki** (*chärn-yĕts'kē*), **Stephen** (1599–1665). Polish general; drove Swedes under Charles X from Poland, and restored kingdom to King John Casimir (1655–57).
**Czecho-Slovak** (*chĕk'ō-slō-văk'*) **Republic** (Czecho-Slovakia), state of cent. Europe created in 1918; 54,700 sq. mi.; pop. 13,600,000; cap. Prague; **947–8,** *maps*, **947, 1196–7**; Bohemia, **447, 270**; history, **948, 447, 1703**; industries, **947–8, 270**; people, **948, 3250**; Prague, **2911**; woman suffrage, **3779.** *See also* **Austria-Hungary.**
**Czechs,** people, **3250, 948**; in Bohemia, **447, 273, 1354**; language developed by Huss, **1705**.
**Czenstochowa** (*chĕns-tō-ĸō'vä*). Polish city 65 mi. n.w. of Cracow; pop. 100,000; textiles.
**Czernin** (*chĕr'nĭn*). **Ottokar, Count** (born 1872). Austro-Hungarian statesman; as minister to Rumania at outbreak of World War made vain effort to win over Rumania to Central Powers; as Minister of Foreign Affairs (1916–18) sought to save Austria-Hungary by concessions, as against Ger. determination to obtain military decision; played conspicuous part in negotiations at Brest-Litovsk.
**Czernowitz** (*chĕr'nō-vĭts*) or **Cernauti.** City in n. Rumania on Pruth R.; pop. 87,000; farm trade; university; strategic point in World War.
**Czerny** (*tsĕr'nē*), **Karl** (1791–1857). Austrian pianist and composer; teacher of Liszt; exercises for pianoforte still widely used.
**Czerny George.** Same as **Kara-George.**
**Czolgosz** (*chōl'gŏsh*), **Leon** (1873–1901), anarchist; assassinates Pres. McKinley, **2104**.

# D

IN Egyptian picture-writing the symbol corresponding to our letter D was a hand  When it became conventionalized, it looked like this  and later among the Phoenicians became a triangle with a short tail  the tail in time being dropped. The Phoenicians called it *Daleth*, which means "door." If you fail to see the resemblance between the form of this letter and that of a door, remember the primitive house was a tent and the door simply a triangular curtain hung in front of the opening. The name and form of this letter were adopted by the Greeks with slight variation, and thus *Daleth* became *Delta* Δ You remember you learned in your Geography that the delta of a river gets its name from its resemblance to the Greek letter *Delta*. For a long time its form did not change greatly, but it showed a tendency to turn over and over like an acrobat. Thus in one form we find it standing on its head, and in another the apex is turned to the right. When the sides which met at the right were written or engraved at one stroke, it became the D with the rounded back which was adopted by the Romans and which we use today. In sound *d* is classed with *t* as a dental. Its sound is produced by placing the tip of the tongue against the sockets of the teeth, while the vocal cords are vibrating. Without the vibration *d* becomes *t*. It is therefore called a "voiced" dental, while *t* is an "unvoiced" dental.

**Dab'chick,** or pied-billed grebe, **1515.**

**Daboia** (*dȧ-boi'ȧ*), a viper, **3647.**

**Dacca** (*dăk'ȧ*). City of Brit. India in e. Bengal on Boor Gunga R.; pop. 110,000; muslins, gold and silver ware, shell bracelets; university; magnificent ruins.

**Dachshund** (*dăĸs'hu̇nt*), Ger. hunting dog, **1023.**

**Dacia** (*dā'shĭ-ȧ*), anc. country of cent. Europe, n. of Danube R., **962, 3080.**

**Dactyl** (*dăk'tĭl*), in poetry, **2851.**

**Daddy-long-legs,** or harvestman, a spider-like arachnid with small body and very long legs, **3325.**

**Daedalus** (*dĕd'ȧ-lŭs*), in Gk. myth., the first man to fly, **949.**

**Daf'fodil, 2397.**

**Daggers, 3422, 3423.**

**Da'gon,** a Philistine god, **2770.**

**Daguerre** (*dä-gĕr'*), **Louis** (1789–1851), Fr. painter and physicist; invents daguerrotype, **2784.**

**Daguer'rotype,** an early kind of photograph, **2784.**

**Dahlgren** (*dăl'grĕn*), **John Adolf** (1809–70). Amer. admiral, b. Philadelphia; blockaded Charleston during Civil War; inventor of smooth-bore Dahlgren gun.

**Dahlia** (*dăl'yȧ*), garden flower, **949.**

**Dahomey** (*dȧ-hō'mĭ*), fertile colony of Fr. W. Africa, former negro kingdom; 42,460 sq. mi.; pop. 860,000; 70 mi. coast; chief city Porto Novo; *map*, **40–1;** army of women, **106.**

**Daibutsu** (*dī'bu̇ tsu̇*), or Great Buddha, famous bronze image in Japan, **1874,** *picture*, **1876.**

**Daimio** (*dī'mē-ō*), Jap. feudal baron, **1868.**

**Daimler, Gottlieb** (1834–1900), Ger. inventor, **276.**

**Dairen** (*dī-ren'*), **Tairen,** or **Dalny.** Customs port in s. Manchuria, on Liaotung Peninsula 20 mi. n. of Port Arthur; pop. 55,000; outranked only by Shanghai among Chinese seaports; exports soy beans and coal; founded by Russia 1899; "leased" to Japan 1905.

**Dairying, 949–53;** Australia, **264;** butter, **952, 543–4, 2581;** Canada, **953, 2582, 2946, 2449;** cattle, **950, 953, 663, 44;** Channel Isls., **687;** cheese, **708–9, 952;** cream separator, **950, 682;** Denmark, **994, 996;** goats, **1477, 2238;** Ireland, **1807;** Italy, **1840;** milk, **950–3, 2238–9;** Netherlands, **2440;** New Zealand, **2499;** Norway, **2534;** oleomargarine, **2577–9;** Sweden, **3404,** *picture*, **3403;** Switzerland, **3415, 3416, 2238, 1477.** —*U.S.*, **953, 2485, 3586;** Ill., **1732;** Iowa, **1806;** Kan., **1911;** Minn., **2254;** Neb., **2581, 2430;** N.D., **2525;** N.Y., **2485;** Pa., **2721;** Wis., **3770, 2485.**

**Daisy,** small field plant with yellow or white-headed flowers, **953;** "Shasta," **538.**

**Dakar** (*dăk'ȧr*). Fortified naval station and r.r. terminus, in Senegal at tip of Cape Verde; pop. 26,000; cap. of Fr. W. Africa.

**Dakota Wesleyan University.** Meth. co-ed. institution at Mitchell, S.D.; founded 1885; academy, college of liberal arts, schools of education, commerce, elocution.

**Dako'tahs,** often called Sioux, Indian tribe of Siouan stock; formerly roamed in Upper Mississippi region; **1767, 2257, 2432, 3296.**

**Dale, Sir Thomas** (d. 1619). Colonial governor or "high marshal" of Va. 1611–16; enforced laws with rigor, labored for colony's welfare with energy.

**Dalecarlia** (*dä-lē-kär'lĭ-ȧ*) ("the valleys"), picturesque region in Sweden; three-fourths of it is forest land; iron, copper, silver, lead; peasant costumes, *pictures*, **3402.**

**D'Alembert** (*dä-läṅ-bêr'*). **Jean le Rond.** *See in Index* **Alembert.**

**Dalget'ty, Dugald.** Brave, pedantic swashbuckler in Scott's 'Legend of Montrose'.

**Dalhou'sie, George Ramsay,** 9th **Earl of** (1770–1838). One of Wellington's generals in Peninsular War and at Waterloo; lieut.-gov. of Nova Scotia 1816–20; gov.-gen. of Canada 1820–28; founded Dalhousie College.

**Dalhousie, James Ramsay,** 10th **Earl** and first **Marquis of** (1812–60). One of the master-builders of Brit. Indian Empire; gov.-gen. 1849–56; annexed Punjab and other native states; established imperial telegraph and postal systems; built first r.r., completed Ganges canal, and many other public works.

**Dalhousie College and University.** At Halifax, Nova Scotia; co-ed.; founded 1821, opened 1838; arts and science, law, medicine, pharmacy, dentistry, music.

**Dallas, Alexander James** (1759–1817). U.S. sec. of treasury 1814–16 under Madison; found govt. bankrupt, left surplus of $20,000,000; Henry Adams says he "fixed the financial system in a firm groove for twenty years."

**Dallas, George Mifflin** (1792–1864), Amer. statesman, son of Alexander J.; b. Philadelphia, Pa.; U.S. senator 1831–33; atty.-gen. of Pa. 1833–35; minister to Russia 1837–39; vice-president of U.S., **2872, 3636.**

**Dallas,** Tex., leading mfg. city and r.r. center of state; pop. 158,976; **953–4, 3477.**

**Dallas, University of.** Cath. institution for men at Dallas, Tex., founded 1907; college, preparatory, engineering courses.

**Dalles** or **Dells,** river rapids, especially when river has cut a gorge between rocky walls; Columbia R., **3687;** Wisconsin rivers, **3770,** *picture*, **3771.**

**Dalmatia** (*dăl-mā'shȧ*), constituent part of Jugo-Slavia, bordering Adriatic; former Austrian crownland; 5000 sq. mi.; pop. 622,000; **272–3, 1286, 3795, 307,** *map*, **271.**

**Dalmations, 3250, 273.**

**Dalmores** (*dăl-mō-rĕs'*), **Charles** (born 1871). Fr. operatic tenor (Samson in 'Samson and Delilah'; Herod in 'Salome'); sang several seasons in New York and Chicago.

**Dalny,** Manchuria. Same as **Dairen.**

**Dalriada** (*dăl-rī-ā'dȧ*). Name of two anc. Gaelic kingdoms, one in Ireland (in county Antrim) and other in Scotland (in Argyllshire); united with n. kingdom of Picts (843).

**Dal River** (Swedish *Dal-Elf*), in s. Sweden, rises on Norwegian frontier, flows s.e. and n.e. 250 mi., forming several lakes, and enters Gulf of Bothnia; *map*, **2531.**

**Dalton, John** (1766–1844), Eng. chemist and physicist; presented first scientific evidence for atomic theory and effected revolution in chemistry; **2174;** "Daltonism," **1216.**

**Dalton,** Ga. City 80 mi. n.w. of Atlanta; pop. 5000; iron, limestone; trade in cotton, grain, fruit; headquarters of Gen. Jos. E. Johnston, defending Atlanta (1863–64).

**Dalton,** Mass., town 5 mi. e. of Pittsfield; pop. 3752; makes paper, woolens, and spark coils; paper for U.S. money, **2284.**

**Da'ly, John Augustin** (1838–99). Amer. dramatist and theatrical manager, b. Plymouth, N.C.; organized Shakespearean company headed by Ada Rehan; among actors he managed were Clara Mor-

ris, John Drew, Fanny Davenport, Maude Adams; owned valuable theatrical library.
**Daly, Marcus A.** (1842–1900), Amer. miner, b. in Ireland; made vast fortune; called "copper king"; **2309.**
**Dam, 954;** built by beavers, **356,** *picture,* **357;** for irrigation, **1828–9;** in upper Mississippi R., **2266, 2268.** —*Famous dams:* Arrowrock, **1829, 1725;** Assuan, **1828, 1094,** *picture,* **1096;** Croton, *picture,* **2486;** Elephant Butte, **2465, 1139, 1829,** *picture,* **2464;** Gatun, **2658, 2663,** *picture,* **2658;** Keokuk, **1804, 1806, 2268,** *picture,* **1805;** Lahontan, *picture,* **1829;** Minidoka, **1725;** Roosevelt, **202,** *pictures,* **200, 1830;** Shoshone R., **3820;** Yuma, **202.** *See also in Index* **Dikes; Levees.**
**Damanhur** (*dä-män-hur'*). In Lower Egypt, r.r. center 38 mi. s.e. of Alexandria; pop. 48,000; makes textiles; anc. Timenhor (town of Horus), known to Greeks as Hermopolis Parva.
**Damão** (*dä-mouñ'*) or **Daman,** Port. seaport and settlement on w. coast of India at entrance to Gulf of Cambay, **1756.**
**Damascene** (*dăm-à-sēn'*), ornamentation of metal by inlaying with other metals, **956–7, 1876.**
**Damascus** (*dà-măs'kŭs*), chief city of Syria; pop. 250,000; **954–7;** captured in World War, **3807;** center of Saracen culture, **2278;** damask cloth, **804, 956;** early glass-making, **1474;** railroad to Mecca, **165, 2187;** swords, **956–7.**
**Dam'ask cloth, 804, 932, 956.**
**Damask rose, 533.**
**Damien** (*dä-mē-ăñ'*), **Father** (1840–89). Belgian priest, missionary to lepers of Molokai, Hawaiian Isls.; organized sanitation, schools, industry, and worship; died of leprosy; eulogized by R. L. Stevenson.
**Damietta** (*dăm-ĭ-ĕt'à*), port and trade center in Lower Egypt on branch of Nile, 100 mi. n.e. of Cairo; pop. 31,000; anc. city bulwark of Egypt against Crusaders; **1096.**
**Dam'mar,** a resin, **2997, 3619.**
**Damocles** (*dăm'ō-klēz*), **957.**
**Damon, Esther S.** (d. 1906), **2722.**
**Damon and Pythias, 957.**
**Damped waves,** in radio telegraphy, **3762.**
**Dampier** (*dăm'pēr*), **William** (1652–1715), Eng. buccaneer and explorer, **266.**
**Dampier Archipelago.** Group of high rocky isls. off n.w. coast of Australia.
**Damrosch** (*dăm'rŏsh*), **Leopold** (1832–85). Amer. musician, b. in Germany; founder of Ger. opera in New York; father of Walter J. Damrosch.
**Damrosch, Walter J.** (born 1862). Amer. musician, b. in Germany, founder of Damrosch Opera Company and director of New York Symphony Orchestra.
**Damsel-fly,** a slender-bodied dragonfly, **1028.**
**Damson plum, 2840.**
**Dan.** Son of Jacob and Bilhah, ancestor of Hebrew tribe of Dan (Gen. xxx, 6).
**Dan.** Anc. town in n. Palestine at head of the Jordan, settled by descendants of Dan; "from Dan to Beersheba," from one end of Palestine to the other.
**Da'na, Charles Anderson** (1819–97). Amer. journalist, b. Hinsdale, N.H.; brilliant editor, and part owner of New York *Sun,* on which he impressed his strong, concise style.
**Dana, Francis** (1743–1811). Amer. jurist; chief justice of Mass. Supreme Court 1791–1806; envoy to Russia, **14.**
**Dana, Richard Henry, Jr.** (1815–82). Amer. jurist and author, b. Cambridge, Mass.; 'Two Years Before the Mast', classic sea story, describing voyage as common seaman to Calif.
**Danae** (*dā'nā-ē*), in Gk. myth., mother of Perseus, **2731, 2732.**
**Danaides** (*dăn-ā'ē-dēz*). In Gk. myth., the 50 daughters of Danaüs, king of Libya, doomed to fill sieves with water throughout eternity for killing their husbands at their father's command.
**Danbury,** Conn., famous hat-making city 60 mi. n.e. of New York City; pop. 20,000; settled 1684; **864, 1597.**
**'Dance of the Nymphs',** painting by Corot, **1244,** *picture,* **1245.**
**Dancing:** folk dances, **1316–9;** among N. Amer. Indians, **1770–1;** "devil-dancers," *picture,* **1750, 2118;** nautch girl, *picture,* **1751;** Siamese dancer, *picture,* **3227;** Spanish, *picture,* **3299;** Swedish, **3402.**
**Dan'delion,** flowering herb of chicory family, **957;** pollen grain, *picture,* **1309;** seeds, **3172, 3712, 2417.**
**Dandie Dinmont.** In Scott's 'Guy Mannering', a rough, shrewd, humorous Scotch farmer from whose dogs are named the "Dandie Dinmont" breed of Scotch terriers.
**Dandolo** (*dän'dō-lō*), **Enrico** (1120?–1205). Doge of Venice 1193–1205; leader of Crusaders in capture of Constantinople during 4th Crusade.
**Danegeld** (*dān'gēld*). A tax levied in England 10th to 12th cents.; originated as tribute to Danes.
**Dane'law** or **Danelagh.** Territory in e. England ruled by Danes in 9th and 10th cents.
**Danemora** (*dä-nē-mō'rà*) or **Dannemora,** village in Sweden 30 mi. n. of Upsala; iron mines, **3402.**
**Danes** (modern). *See* **Denmark.**
**Danes** (Northmen), **997;** in England, **639, 90, 1152;** costume, *picture,* **1151.** *See also in Index* **Northmen.**
**Daniel,** Hebrew prophet, central figure of the Book of Daniel, **2922–3, 298.**
**'Daniel Deronda'.** George Eliot's last, and in the opinion of some, greatest novel; story of a young Jew, brought up in ignorance of his race, who returns to his own people.
**Daniels, Josephus** (born 1862). Amer. journalist and political leader; editor Raleigh (N.C.) *News and Observer* after 1894; sec. of navy 1913–21.
**Danish East India Company, 1073.**
**Danish language and literature, 3134.**
**Dan'necker, Johann Heinrich von** (1758–1841), Ger. sculptor, friend of Schiller; his work a constant struggle between classic and naturalistic schools; **3158.**
**D'Annunzio.** *See in Index* **Annunzio.**
**Dante** (*dän'tā*) **Alighieri** (1265–1321). greatest Ital. poet, **957–8, 2995,** *pictures,* **1832, 960;** at Bologna, **450;** 'Divine Comedy', story of, **958–61;** friendship with Giotto, **1462;** influence on Ital. language, **1832.**
**Dantès** (*dän-tĕs'*), **Edmond.** Hero of Dumas' 'Count of Monte Cristo'; sailor who, condemned through conspiracy to life imprisonment, escapes, gains buried treasure, and returns to dazzle Paris as the fabulously wealthy Count of Monte Cristo.
**Danton** (*dän-tôn'*), **Georges Jacques** (1759–94). Fr. Rev. leader, **961, 1370, 3028;** leads Jacobins, **1859;** and Madame Roland, **3039.**
**Danube** (*dăn'ūb*) **River,** 2d r. of Europe; extends 1750 mi. from s.w. Germany to Black Sea; internationalized (1919) from Ulm to sea; **961–2, 1188, 1190;** in Bavaria, **961;** Hungary, **270, 1702, 1703, 524;** jetties, **1888;** Jugo-Slavia, **1902;** northern boundary of Roman Empire, **347, 1446, 3642;** Rumania, **3081, 3082.**
**Danvers,** Mass. Historic town 4 mi. n.w. of Salem, of which it was once a part; pop. 11,108; birthplace of Israel Putnam; home of Whittier; shoes, leather, brick, etc.; state insane asylum.
**Danville,** Ill. Mfg. and mining center 115 mi. s. of Chicago; pop. 33,776; various mfrs.; National Soldiers' Home for veterans.
**Danville,** Ky. Stock-raising center 40 mi. s. of Frankfort; pop. 5100; tobacco warehouses; Centre College.
**Danville,** Va. City near center of s. boundary on Dan. R.; pop. 21,539; important market for loose-leaf tobacco; tobacco and furniture factories, cotton and flour mills.
**Danzig** (*dän'tsĭĸ*), a free city under League of Nations, at mouth of the Vistula R.; pop. (city) 180,000, (territory) 350,000; **962, 3651,** *map,* **1440.**
**Daphne** (*dăf'nĕ*), a nymph in Gk. myth., turned into laurel tree, **962, 1970;** grove at Antioch, **150.**
**D'Arblay** (*där'blā*), **Frances.** *See in Index* **Burney, Fanny.**
**Darby and Joan** (*jōn*). John Darby (d. 1730) and his wife Joan, originals of hero and heroine of Henry Woodfall's ballad 'Darby and Joan' or 'The Happy Old Couple', illustrating conjugal felicity.
**Dardanelles** (*där-dà-nĕlz'*) (anc. Hellespont), narrow strait separating Europe from Asia, **963;** bridged by Xerxes, **2739–40;** in World War, **434, 3795, 3807.**
**Dare, Virginia** (born 1587), first child born of Eng. parents in America, **2517, 2521.**
**Dar-es-Salaam** (*där'ĕs-sà-läm'*), seaport, cap. of Tanganyika Territory, E. Africa, **1068, 1069.**
**Darfur** (*där'fụr*). Westernmost division of Anglo-Egyptian Sudan; 150,000 sq. mi.; pop. 1,000,000.
**Darien** (*dā-rĭ-ĕn'*), **Isthmus of.** Another name for Isthmus of Panama; sometimes applied only to lower portion.
**Darien Scheme.** Unsuccessful attempt to establish Scotch colony on Isthmus of Panama (Darien), headed by William Paterson; settlement begun 1698; Span. opposition, starvation, and disease led to abandonment 1700.
**Darius** (*dà-rī'ŭs*) **I, the Great** (558?–485 B.C.), king of Persia, **2737–8;** attempts to conquer Greece, **2738–9;** triumphs recorded on Behistun Rock, *picture,* **2739.**
**Darius III** (380?–330 B.C.), last king of Persian Empire; conquered by Alexander the Great, **86, 2738;** family of, *picture,* **2641.**
**Darjeeling** (*där-jē'ling*), health resort in n. Bengal, Brit. India, in Sikkim Himalayas, 7000 ft. above sea level; pop. 17,000; cap. of dist. of Darjeeling; **1650.**
**Dark Age,** in history, **1654.**
**"Dark Continent," 32.**
**Dark-line spectrum,** defined, **3312.**
**Dark stars, 3340.**
**Darling, Grace** (1815–42), Eng. heroine, **2003.**
**Darling Range.** Low mts. in w. Australia, running parallel with coast for nearly 250 mi.
**Darling River,** Australia, rises in Queensland, flows s.w. through New South Wales, joins Murray; length 1160 mi.; **262–3.**
**Darmstadt** (*därm'shtät*), Germany, mfg. and r.r. city, cap. of republic

of Hesse, 20 mi. s. of Frankfort; pop. 83,000; Holbein's Madonna, **1673.**

**Darning, 3185.**

**Darning needle,** a dragon-fly, **1028.**

**Darn'ley, Henry Stuart, Lord** (1545?–67), Scotch noble, 2d husband of Mary Queen of Scots, **2158.**

**D'Arsonval** (*där'sŏn-văl*) galvanometer, **1392, 1113.**

**Darter.** A water bird of the family *Anhingidae* found in Asia, Africa, Australia, and the s. U.S.; Amer. species (*Plotus anhinga*) also called the snake bird or water turkey; resembles cormorant in habit and appearance.

**Darter.** A group of small freshwater fishes of the perch family found only in the U.S.; smallest spiny-rayed fishes known, their extreme length being 10 inches.

**Dart'moor,** rugged tableland in s.w. Devonshire, England; about 20 sq. mi.; site of military prison, scene of massacre of Amer. naval prisoners by British (April 1815) in War of 1812; druidical and other remains; **1150.**

**Dartmouth** (*därt'mŭth*), England. Seaport in Devonshire, near mouth of Dart R.; pop. 7000; here Crusaders embarked for Holy Land (1190).

**Dartmouth,** Nova Scotia. Industrial town and summer resort on Halifax harbor; pop. 8000; foundries, ship yards, lumber mills, cordage works, oil and sugar refineries.

**Dartmouth College.** At Hanover, N. H.; men; chartered 1769; arts and sciences, medicine, graduate school of civil engineering, administration and finance; **830, 3140, 2454,** *picture,* **2455.**

**Darwin, Charles Robert** (1809–82), Eng. biologist, **963–5;** developed theory of organic evolution, **1208, 1210;** effects of theory upon biology, **398;** on cruise of the *Beagle,* **2623, 1079;** quoted, **856, 2828–9;** relations with Huxley, **1706.**

**Darwin, Erasmus** (1731–1802), Eng. physician, naturalist, and poet, grandfather of Charles Darwin, **963, 964.**

**Darwin, George Howard** (1845–1912), Eng. geologist and astronomer, son of Charles Darwin; estimate of earth's age, **1060.**

**Darwin,** Australia. Seaport and chief town of Northern Territory on n.w. coast.

**Darwinism,** the evolutionary theory of Charles Darwin, **963–4, 1208, 1210, 398.**

**Dash,** mark of punctuation, **2936.**

**Dashur,** Egypt, place s. of Great Pyramids; noted for pyramids; **1102.**

**Dashwood, Elinor** and **Marianne.** Two sisters who represent 'Sense and Sensibility' in Jane Austen's novel of that name.

**Date Line, International, 3501,** *map,* **2624–5.**

**Date palm, 966–7, 2647.**

**Dates,** food value, **1320, 1321.**

**Daubigny** (*dō-bē-nyē'*), **Charles François** (1817–78), Fr. landscape painter and etcher of Barbizon school; his finest pictures are tree-bordered river scenes, often with a few ducks; **2632.**

**Daudet** (*dō-dā'*), **Alphonse** (1840–97). Fr. novelist, compared, for humor and sentimental pathos, to Dickens; he wrote 'Tartarin de Tarascon', good-natured satire on the boastful, imaginative Provençal; 'Numa Roumestan', satire on Gambetta; 'La Belle Nivernaise', children's story.

**Daugherty, Harry M.** (born 1860). Amer. lawyer; campaign manager for Pres. Harding and U.S. atty.-gen. in his administration.

**Daughters of the American Revolution, 2695.**

**Daughters of the Confederacy, 2695.**

**Daughters of the Revolution, 2695.**

**Daumier** (*dō-myā'*), **Honoré** (1808–79). Fr. caricaturist and painter, inspired by inexhaustible genius for mockery of social and political life; drew about 4000 lithographs; as a painter was a pioneer of naturalism.

**Dau'phin** (Fr. "dolphin"), title borne first by rulers of certain Fr. territories, called the Dauphiné; later, when the Dauphiné became crown land (1364), by the Fr. king's eldest son; Charles VII, **1893, 1700, 694;** Louis XVII, the "Lost Dauphin," **2067.**

**Dauphin,** Manitoba. Town 178 mi. n. of Winnipeg; pop. 4000; on Vermilion R.; grain elevators, flour mills.

**Dauphiné Alps,** a range of the Alps in former Dauphiné province in s.e. France (greatest height, 13,462 ft.), **3012,** *map,* **1351.**

**Davenport, Fanny** (1850–98). Amer. actress, star in wide variety of comic and tragic rôles under management of Augustin Daly; greatest success in 'Fedora', 'La Tosca', and 'Cleopatra'.

**Davenport, Homer C.** (1867–1912). Amer. caricaturist, remembered for his political cartoons; originated brutish giants to represent trusts and the dollar-marked suit of Mark Hanna.

**Davenport, John** (1597–1670), **2456.**

**Davenport,** Iowa. City on Mississippi R. opposite Rock Island, Ill.; pop. 56,727; shipping point for farm produce, coal; heavy machinery, locomotives, farm implements, flour, lumber.

**Da'vid,** king of Israel (about 1000 B.C.), **967;** birthplace, **387;** descended from Ruth, **3102;** takes Damascus, **954, 957;** conquers Jerusalem, **1886;** statue by Michelangelo, **2222, 1850.**

**David I** (1084–1153), king of Scotland 1123–53. Son of Malcolm Canmore and Saint Margaret of England; called "maker of Scotland"; reformed courts, established many towns; promoted trade, shipping, and manufactures.

**David II** (1324–71), king of Scotland. Crowned king 1331 at death of father, Robert Bruce; began to rule 1341; weak and incapable.

**David** (*dā-vēd'*), **Félicien César** (1810–76). Fr. composer, called "the musical orientalist"; wandered for years in East and expressed oriental melodies in gorgeous orchestral colors; wrote symphonic ode, 'The Desert'; oratorio, 'Moses on Sinai'; operas, 'Herculaneum', 'Lalla Rookh'.

**David, Jacques Louis** (1748–1825). Fr. portrait and historical painter, active revolutionist, zealous Jacobin, later court painter to Napoleon; painted 'Coronation of Napoleon I', 'Blind Belisarius Asking Alms'.

**'David Copperfield',** novel by Charles Dickens, **1006.**

**'David Harum'.** Novel by Edward Noyes Westcott (1847–98); hero a shrewd horse-trader and humorous homely philosopher.

**Davidson, John** (1857–1909). Eng. poet, thoroughly pessimistic, best known for ballads; wrote 'Bruce', 'Scaramouch in Naxos', fantastic plays; 'Fleet Street Eclogues'; 'Earl Lavender', romantic story.

**Davidson College.** At Davidson, N.C.; men; Presb.; founded 1837; arts and sciences.

**Davies, Arthur B.** (born 1862), Amer. painter of ultra-modern tendencies, **2634;** his creed, **1243.**

**Davies, Dr. Charles** (1798–1876), Amer. mathematician, *picture,* **148.**

**Davies, Sir Louis Henry** (born 1845), Canadian statesman and jurist; in House of Commons 1882 to 1901, when he became judge of Supreme Court; minister of marine and fisheries 1896–1901.

**Davis, Arthur Hoey** (born 1861), Australian author, **268.**

**Davis, Henry G.** (1823–1916), Amer. capitalist and Democratic politician; made fortune in lumber and coal; defeated for vice-presidency, **3060.**

**Davis, James J.** (born 1874). U.S. sec. of labor in cabinet of Warren G. Harding; b. in Tredegar, Wales; a laborer in youth.

**Davis, Jefferson** (1808-89), president of the Confederate States of America, **967–8, 857, 858, 3353.**

**Davis** or **Davys, John** (1550?–1605). Eng. navigator and early Arctic explorer; discovered (1587) Davis Strait; **2860, 3107.**

**Davis, Richard Harding** (1864–1916). Amer. novelist and war correspondent, wrote breezy stirring stories, full of adventure ('Van Bibber and Others'; 'Soldiers of Fortune'; 'The Bar Sinister'; 'Ranson's Folly').

**Davis, Theodore M.,** archeologist, **570.**

**Davis Strait,** between Greenland and Baffin Land, connects Baffin Bay with Atlantic; width 180 to 500 mi.; *map,* **2514–5.**

**Davitt** (*dăv'ĭt*), **Michael** (1846–1906). Irish political leader and founder of the Irish Land League (1879); bitterness that marked his entire career sprang from eviction of parents for non-payment of rental during his childhood; several times returned to Parliament and after several unseatings allowed to retain seat; ardent "Home Ruler" but opposed to Parnell.

**Davos** (*dä'vōs*), winter resort in Switzerland, *picture,* **3413.**

**Davout** (*dä-vụ'*), **Louis Nicolas, Duke of Auerstädt and Prince of Eckmühl** (1770–1823). One of Napoleon's marshals; distinguished himself by brilliant victories at Auerstädt and Eckmühl, turned tide at Wagram; minister of war during "100 days."

**Davy, Sir Humphry** (1778–1829), Eng. chemist and physicist, **968–9;** arc lamp, **1123;** developed theory of heat, **1618;** discovered magnesium, **2121;** potassium, **2898, 1121;** sodium, **3272, 1121;** electrolysis experiments, **1121;** Faraday, **1224, 1799;** pronounced gas-lighting impractical, **1797;** suggested use of nitrous oxide as anesthetic, **124;** safety lamp, **1958.**

**Davy Jones.** Sailor's colloquial name for the devil or bad spirit of the sea; 'Davy Jones' Locker', place where men and ships go when lost at sea.

**Dawes, Charles Gates** (born 1865). Amer. banker and business man; b. Marietta, Ohio; comptroller of currency 1897–1902; brig.-gen. in World War, general purchasing agent of A.E.F.; member of liquidation commission, War Dept.; U.S. director of budget, 1921–22.

**Dawes, William,** Amer. patriot, **1990.**

**Dawn,** or daybreak, **3570.**

**Daw'son, George Mercer** (1849–1901). Canadian geologist, son of Sir John William Dawson; director Geological Survey of Canada 1895–1901.

**Dawson, Sir John William** (1820–99). Canadian geologist, whose studies were largely responsible for development of Nova Scotia coal mines; opposed Darwinism; principal of McGill Univ. 1855–93.

**Dawson,** cap. of Yukon Territory and center of Klondike mining region on Yukon River; pop. at time of gold rush 20,000, now 3000; **3835–6, 1933.**
**Day, 969, 3500–1;** day breeze from ocean, **3751;** lunar; **2318, 2321;** length on planets, **2816;** Sabbath, **3103;** sidereal, **3502;** twilight and dawn, **3570.**
**Day-fly** or **May-fly, 2178.**
**Daylight saving, 969, 3501, 3802.**
**Days of grace, 969.**
**Day'ton,** Ohio, mfg. city; home of Wright brothers, and the cash register; pop. 152,559; **970, 2570.**
**Dayto'na,** Fla., city 110 mi. s. of Jacksonville; pop. 4445; popular winter resort; oranges, strawberries; automobile races; **3122.**
**'Dead, Book of the', 1100.**
**Deadfall,** a trap, **3527.**
**Dead letter office, 2894.**
**Deadly nightshade,** or belladonna, **2509, 10, 2855,** *picture,* **2853;** related to potato, **2901,** to tobacco, **3510,** to tomato, **3512.**
**Deadly upas-tree,** or auchar, a member of the fig family growing chiefly in Java, **3532–3.**
**Deadman's hand,** a seaweed, *picture,* **3170.**
**Dead Man's Hill** (*Mort Homme*), **3629.**
**Dead reckoning, 2420.**
**Dead Sea,** salt lake in s.e. Palestine; 340 sq. mi.; **2644, 226,** *picture,* **227.**
**Dead stars, 3340.**
**Deadwood,** S.D., trade center for Black Hills mining region; pop. 2403; smelting and refining; **3294.**
**Deaf, education of, 970;** Helen Keller, **1916;** Laura Bridgman, **436.**
**Deafness,** caused by neglect, **1714.**
**Déak** (*dā-äk'*), **Francis** (1803–76), Hungarian statesman, one of ablest political leaders in Europe; chief organizer (1867) of Austro-Hungarian dual monarchy; **1945.**
**Deakin** (*dē'kĭn*), **Alfred** (1856–1919). Australian statesman, three times prime minister; called most brilliant orator of Brit. Empire; reconciling influence between Labor and Conservative parties.
**Dean, Forest of.** District (22,000 acres) in w. Gloucestershire, England; between Severn and Wye rivers; anc. royal forest.
**Deans, Jeanie.** The heroine of Scott's 'Heart of Midlothian'; a simple Scotch peasant girl who refuses to testify falsely to save her sister Effie from conviction of child murder, but walks alone most of the way from Edinburgh to London to win her pardon from Queen Caroline; one of Scott's strongest and noblest characters.
**Dearborn, Fort.** *See in Index* **Fort Dearborn.**
**Dearborn, Henry** (1751–1829). Amer. general for whom Ft. Dearborn (now Chicago) was named; served in Revolution and War of 1812; sec. of war under Jefferson; minister to Portugal 1822–24.
**Death cup** or **Amanita, 2375,** *pictures,* **1382, 2374.**
**Death penalty, 2919.**
**Death rate,** decrease in, **2880;** mortality tables, **1792.**
**Death's head moth, 548.**
**Death Valley,** Calif., desert region of s. Calif., **970, 3736;** borax, **464.**
**Death-watch,** a beetle, **370,** *pictures,* **369.**
**Debits,** in bookkeeping, **5.**
**Deb'orah,** Hebrew heroine, prophetess, and judge who helped deliver Israelites from Canaanites, **1890.**
**Debreczen** (*dĕb'rĕt-sĕn*), Hungary. City 135 mi. e. of Budapest; pop. 93,000; center of Hungarian Protestantism; here Kossuth (1849) proclaimed deposition of Hapsburgs; varied mfrs. and trade.
**Debs, Eugene Victor** (born 1855). Amer. Socialist lecturer and labor organizer, b. Terre Haute, Ind.; many times Socialist candidate for president, once while imprisoned (1918–21) for violation of espionage act.
**Debt,** bankruptcy laws, **326–7;** Greek law, **3274;** Rom. law, **3044, 327.**
**Debt, national, 2399, 3677, 1569.**
**Debussy** (*dē-bü-sē'*). **Claude Achille** (1862–1918), Fr. composer, leader of a new school; produced music of elusive and subtle beauty by use of "whole-tone" scale, and largely dispensing with melody; chief works, **2381;** place in development of opera, **2584.**
**Dec'alogue** ("ten words"), the Ten Commandments, **2333.**
**'Decam'eron',** a famous collection of stories by Giovanni Boccaccio, **1833, 433, 2996.**
**Decatur** (*dē-kā'tŭr*), **Stephen** (1779–1820), Amer. naval officer, **971, 1973, 2810.**
**Decatur,** Ga. Town 6 mi. e. of Atlanta; pop. 6150; Agnes Scott College (for women).
**Decatur,** Ill., city 35 mi. e. of Springfield; pop. 43,818; large corn and flour mills, iron works; birthplace of Grand Army of the Republic (1866); James Millikin Univ., founded 1901; **1736.**
**Decay,** caused by bacteria, **302, 150;** of rock into soil, **3272–3, 1994, 2340.**
**Deccan** (*dĕk'ăn*) or **Dekkan,** the whole peninsula of India s. of the Narbada R., **1745–6,** *map,* **1744;** rainfall, **1747;** vegetation, **1748.**
**Decem'ber,** 12th month in the year, **971;** birthday stone, **1409.**
**Decemvirs** (*dē-sĕm'vĕrs*) ("ten men"), Rom. commission appointed 451 B.C. to draw up code of laws, **3043.**
**Deciduous** (*dē-sid'yu-ŭs*) **plants,** those which shed their leaves periodically, **1208, 3530;** autumn coloration, **1981–2.**
**Dec'igram,** unit of metric system (1.543 grains), **2206.**
**Dec'imals,** in arithmetic, **971–5;** Arabic numerals, **2542;** percentage, **2724.**
**Decimal system,** of coinage introduced in U.S., **1882;** of weights and measurements, **2206, 3714.**
**Dec'imeter,** unit of metric system (3.937 in.), **2206.**
**Decius** (*dē'shŭs*) (201–251 A.D.). Rom. emperor, remembered chiefly for Christian persecutions; killed in battle against Goths.
**Decius Mus. Publius** (d. 340 B.C.), Rom. consul who in battle against Latins devoted himself to death, rushing into midst of foe when his troops began to give way; *picture,* by Rubens, **2640.**
**Declara'tion of Independence, 975–6, 1904, 3002;** Adams, **13;** Hancock, **1570;** Jefferson, **1882;** original draft saved, **3672.**
**Declaration of Paris** (1856), **3530, 437.**
**Declaration of the Rights of Man** (1791), **393, 1368, 1956.**
**Declar'ative sentence, 3175.**
**Declen'sion** of nouns, **2537;** of pronouns, **2922.**
**Dec'lination,** of a star, the angle made between an imaginary line from the observer to the star and the plane of the earth's equator; used in pointing telescopes, **2551.**
**Declination** or **variation,** of compass, angle between magnetic north and true north, **854,** *picture,* **855.**
**Decoration Day** or **Memorial Day, 2196.**
**Decorations of Honor, 976–9, 3579;** orders of knighthood, **979, 1935.**
**Dedham,** Mass., residential town 10 mi. s.w. of Boston on Charles R.; pop. 10,792; founded 1636; had first public school in America supported by general tax (1645); **472.**
**Deduc'tion,** in logic, **2772.**
**Dee,** river 70 mi. long in England and Wales, **3664, 1158.**
**Dee.** River in Scotland famous for salmon; 87 mi. to North Sea at Aberdeen.
**Deep-sea crab,** *picture,* **913.**
**Deep-sea fish, 2556–8, 396;** oar-fish, **1276;** pelican fish, *picture,* **1273.**
**Deer, 979–85,** *pictures,* **3443, 2406, 2407;** altitude range, **397;** caribou, **644;** foot structure, **1322;** horns, **1680;** leathers, **1977, 1475;** moose, **2325;** in prehistoric times, **668,** *picture,* **667;** reindeer, **2993;** stomach, **3082;** 'Story of Fleetfoot the Deer', **982–5;** wapiti, **3669.**
**Deerfield,** Mass. Town 33 mi. n. of Springfield on Connecticut R.; pop. 2803; scene of Bloody Brook Indian Massacre (1675).
**Deerhound,** *picture,* **1022.**
**Deer Park Canyon,** in Ill., **1731.**
**Deerslayer.** Nickname of Natty Bumppo, hero of Cooper's novel, 'The Deerslayer'.
**Defender of the Faith,** title borne by all Eng. sovereigns since Henry VIII; origin, **1636.**
**Defi'ance,** Ohio. Trading and mfg. city on Maumee R. 50 mi. s.w. of Toledo; pop. 8900; Defiance College.
**Defiance College.** At Defiance, Ohio; co-ed.; founded 1902 (formerly Defiance Female Academy); liberal arts, music, normal and commercial work; Christian Biblical Institute affiliated.
**Defoe** (*dē-fō'*), **Daniel** (1661–1731), Eng. novelist and journalist, author of 'Robinson Crusoe', **986, 1166, 2539, 433;** 'Robinson Crusoe in Fact and Fiction', **933–4.**
**De Forest, Lee** (born 1873), Amer. inventor, b. Council Bluffs, Iowa; audion, **257.**
**Deforesta'tion,** effects of, **3532, 795, 1194;** in Spain, **3300;** U.S., **3583, 1759, 1328.** *See also in Index* **Forestry; Forests.**
**Degas** (*dē-gäs'*), **Hilaire Germain** (1834–1917). French impressionist painter, **2633.**
**Degenera'tion,** in biology; barnacles, **331;** parasites, **2678, 3813;** penguins, **2716;** worms, **3813.**
**Degree,** in geometry, **1424;** of latitude, **1968;** of longitude, **2061, 1968;** of temperature, **3486–7, 1620.**
**Degrees, college, 827, 831, 832.** *See also in Index* **Abbreviations.**
**De Haviland battleplane,** *picture,* **62.**
**Dehmel** (*dā'mĕl*), **Richard** (1863–1920), Ger. poet; chief works, **1438.**
**Dehy'drated food, 986-7;** milk, **2239;** prunes, **2928.**
**Deïphobus** (*dē-ĭf'ō-bŭs*), brother of Hector in Gk. myth., **1627.**
**Deira** (*dē'i-rà*). Anc. kingdom in England; united with Bernicia as Northumbria.
**Deirdre** (*dā'thrĕ*), in anc. Celtic myth., a beautiful woman fated to cause misfortune, heroine of most famous of Ulster cycle of old Irish tales, the 'Death of the Sons of Usnech', one of the 'Three Sorrows of Story-Telling'; basis of dramas by Æ, Yeats, and Synge, **1814.**
**De'ism,** defined, **3661.**
**Dejanira** (*dē-yà-nī'rà*), wife of Hercules, **1641.**
**Dek'agram,** unit in metric system (0.353 oz.), **2206.**
**De Kalb** (*dē kălb*), **Johann, Baron** (1721–80), Fr. soldier of German parentage who aided colonists in Rev. War, **987.**
**De Kalb,** Ill. City 60 mi. w. of Chicago; pop. 7871; wire and other iron mfrs.; Northern Illinois State Normal School.

**Dek'ameter,** unit in metric system (393.7 in.), **2206.**
**Dek'kan.** Same as **Deccan.**
**Dek'ker** or **Decker, Thomas** (1570?–1641). Eng. dramatist of Shakespeare's time; "the Dickens of the Elizabethan period"; pictured London life of shop and tavern ('The Shoemaker's Holiday, or the Gentle Craft').
**De Ko'ven, Reginald** (1861–1920), Amer. musical composer, b. Middletown, Conn.; chief works, **2381.**
**Delacroix** (*dē-lä-krwä'*), **Eugene** (1798–1863). Fr. painter, great colorist, leader of Romantic school ('Bark of Dante'; 'Massacre of Chios'; 'The Barricade').
**Delago'a Bay,** inlet of Indian Ocean in Port. colony of Mozambique in s.e. Africa; valuable improved harbor; **1070.**
**Delaine merino,** a breed of sheep, **3200.**
**De la Mare, Walter** (born, 1873). Eng. poet and novelist ('Peacock Pie', elfin fancy and humor; 'Henry Brocken'; 'The Three Mulla Mulgars'; 'Memoirs of a Midget').
**Deland', Margaretta Wade** (born 1857). Amer. novelist and short-story writer, b. Allegheny, Pa. ('John Ward, Preacher'; 'Old Chester Tales').
**Delaroche** (*dē-lä-rōsh'*), **Paul** (real name Hippolyte) (1797–1856). Fr. historical and portrait painter ('The Princess in the Tower').
**Del'aware** or **De la Warr, Thomas West, Baron** (1577–1618), Brit. soldier and administrator; colonial gov. of Va. (1609–18); Delaware state and river named for him; **989.**
**Delaware,** 2d smallest state in U.S.; in Middle Atlantic group; 2370 sq. mi.; pop. 223,003; cap. Dover; **987–9,** *maps,* **988, 3584–5;** govt., **906, 989;** industries and products, **987, 988, 3743;** origin of name, **3347;** state flower, **3347;** Wilmington, **3743.**
**Delaware,** Ohio. City on Whetstone R., 24 mi. n. of Columbus; pop. 8800; Ohio Wesleyan Univ.
**Delaware and Chesapeake Canal, 987.**
**Delaware Bay,** estuary of Delaware R., **989, 2788.**
**Delaware College.** A state institution at Newark, Del.; founded 1833; separate college for women opened 1914; classics, sciences, agriculture, engineering.
**Delaware grape, 1501, 1502.**
**Delaware** or **Lenape** (*lĕn'ăpē*) **Indians,** important Algonquian tribe originally inhabiting N.J. and Delaware R. valley, **1765.**
**Delaware River,** in eastern U.S. (360 mi.), **989;** navigation, **2721, 2718, 2457;** in New York, *picture,* **2481;** in Philadelphia, *picture,* **2721.**
**Delaware Water Gap, 989, 2718.**
**Del'brück, Hans** (born 1848). Ger. historian ('History of Warfare in Relation to Political History'); editor 'Prussian Yearbook'; opposed submarine policy in World War on tactical grounds; member of Delegation to Peace Conference.
**Delcassé** (*dĕl-käs-sā'*), **Theophile** (born 1852). Fr. statesman instrumental in cementing Triple Entente and Fr. alliance with Russia; minister for Foreign Affairs 1898–1905, and for several brief periods between 1911 and 1915; ambassador to Russia 1913.
**Delegate,** in U.S. Congress, the representative of a territory in the House of Representatives, **3601.**
**Delft** (*dĕlft*), Netherlands, quaint Dutch town, 8 mi. n.w. of Rotterdam; pop. 38,000; **2440–1.**
**Delft pottery, 2906.**
**Delhi** (*dĕl'ē*), cap. of India and chief city of Punjab; pop. 235,000; **989–91,** *pictures,* **989, 990, 1753;** peacock throne, **2700.**
**De'lian League, 1522, 251, 195.**
**Delicious monster,** a S. Amer. plant, *picture,* **2826.**
**Delilah** (*dē-lī'lȧ*). Philistine woman loved by Samson, whose downfall she caused by cutting his strength-giving locks (Judg. xvi).
**Della Robbia.** *See in Index* **Robbia.**
**Dells.** Same as **Dalles.**
**Dells,** of Wisconsin R., **3770,** *picture,* **3771.**
**De Long', George Washington** (1844–81). Amer. Arctic explorer, b. New York; d. of starvation on *Jeannette* polar expedition.
**Delos** (*dē'lŏs*), Gk. isl. in Aegean; smallest but most famous of Cyclades; **1528, 1520;** birthplace of Apollo, **156;** treasury of Delian League, **1522.**
**Delphi** (*dĕl'fī*), seat of famous oracle on Mt. Parnassus, Greece, **991, 156;** Celts pillage, **674;** excavations at, **1528;** oracles, **11, 563, 923, 2086, 3487.**
**Del Rio,** Tex., city 170 mi. w. of San Antonio near Rio Grande; pop. 10,589; exports pecans, hides, live stock, fruit and vegetables; **3022.**
**Delta,** earth deposited by rivers at mouth, **3023, 2791;** of Amazon, **105, 493;** Danube, **962;** Ganges, **1393;** Hwang, **1706;** Indus, **1778;** Mississippi, **2266;** Niger, **2508;** Nile, **1096, 2510;** Orinoco, **2600;** Po, **2848;** Rhone, **2791;** Vistula, **3651.**
**Del'toid muscle,** *picture,* **2372.**
**Deluge, The,** flood which overwhelmed the earth in time of Noah (Gen. vii); Babylonian story, **299–300;** Gk. legend, **1000.**
**'De Magnete',** Gilbert's treatise on magnetism (published 1600), **1117.**
**Demarca'tion, Line of.** Imaginary line from North to South Pole 100 leagues w. of Azores; fixed 1493 by Pope Alexander VI; all new lands discovered to e. to belong to Portugal and all w. to Spain.
**Demavend', Mt.,** Persia, extinct volcano, 18,600 ft., **2735.**
**Demesne** (*dē-mān'*) or **domain,** of a lord in feudal system, *picture,* **44.**
**Demeter** (*dē-mē'tēr*), goddess of agriculture in Gk. myth., **991–3, 3607.**
**Demetrius** (*dē-mē'trĭ-ŭs*) or **Dmitri** (*dmē'trē*). Russian pretender, appeared 1603, took name of heir to the throne who had been secretly killed by the usurping czar Boris Gudenof, reigned with vigor and ability until his murder (1606); followed by a series of less able "false Dmitris."
**Demetrius I** (337–283 B.C.). Called Poliorcetes ("besieger"); besieged Rhodes with elaborate machinery 305–304 B.C.; established supremacy over Macedonia and Greece, seizing throne 294 B.C.; expelled by Pyrrhus and died a prisoner of Seleucus.
**De Mille, James** (1833–80). Canadian novelist and teacher; professor at Dalhousie Univ. 1865 to 1880; wrote 30 novels, of which best are 'Helena's Household' and 'A Strange Manuscript Found in a Copper Cylinder'.
**Democ'racy,** form of govt. in which the sovereign power is retained by the people and exercised by their chosen representatives; beginnings in anc. Greece, **1521–2, 3274–5;** Bill of Rights, **393;** France, **1368, 1353;** Industrial Revolution, **1778;** U.S., **3604, 1882–3, 1856.**
**Democrat'ic party** (U.S.), origin and early history, **15, 2870;** Jackson's influence, **1856;** candidates and policies (1836–60), **522, 2872, 3444, 3604, 3616;** Barnburner faction, **2871, 3617;** splits on slavery issue (1860), **968, 1027, 2871, 2012;** peace platform (1864), **2014;** Hayes-Tilden election dispute, **1610–1;** candidates (1880), **1571;** candidates (1888), **1592;** elects Cleveland, **790;** Bryan and bimetallism, **520, 791, 2104;** defeat (1904), **3060;** under Wilson's leadership, **3744–9, 1580, 1582;** and Tammany, **3432;** stand on tariff, **3437.** *See also* names of presidents.
**Democratic Republican party** (U.S.). *See in Index* **Republican party (Jeffersonian).**
**Democritus** (*dē-mŏk'rĭ-tŭs*) (5th cent. B.C.). Gk. philosopher; called 'Aristotle of 5th century', also inappropriately styled the 'Laughing Philosopher', as Heraclitus was the 'Weeping Philosopher'; advanced theory of the mechanical formation of the universe by atoms in action.
**De Morgan, William** (1839–1917), Eng. novelist; for 30 years an artist-potter; began to write at 65, for amusement after illness; excels in naturalness of dialogue, but characters often more important than plot; best novels are 'Joseph Vance', 'Alice-for-Short', 'Somehow Good'; **2541.**
**Demosthenes** (*dē-mŏs'thĕ-nēz*) (about 383–322 B.C.), most famous Gk. orator, **993, 1525;** quoted, **3054.**
**Demot'ic writing, 1099.**
**Demy** (*dē-mī'*), size of paper, **2673.**
**Denain** (*dē-năn'*). Coal-mining and iron-mfg. town in n. France, 6 mi. s.w. of Valenciennes; pop. 27,000; victory of French over allies under Prince Eugene (1712).
**Dena'li, Mt.** or **Mt. McKinley,** Alaska, **2103, 2515, 77,** *picture map,* **75.**
**Dena'rius.** A Rom. coin of silver, later one of copper, the "penny" of the New Testament; "denarius" was Latin name given to Eng. penny; hence its initial (d.) became sign for pence.
**Denatured alcohol, 84.**
**Denby, Edwin** (born 1870). Sec. of navy under Pres. Harding; in Span.-Amer. War as gunner's mate; in World War enlisted in marines as private, rose to major; House of Representatives 1905–11.
**Den'eb,** a star, **3342.**
**Denikin** (*dyē-nē'kĭn*), **Anton** (born 1872). Rus. general on general staff in early part of World War; after revolution followed Kornilov, later becoming anti-Bolshevik Cossack commander operating between Caspian and Black seas 1919; completely routed 1920; fled to England.
**Denis** (*dē-nē'*), **Saint** (Latin **Dionysius),** apostle to the Gauls (250? A.D.), first bishop of Paris, martyr and patron saint of France; the Fr. soldier's war-cry long was "Montjoye Saint Denys!"; abbey, **2685.**
**Den'ison,** Tex. Industrial town 65 mi. n. of Dallas; pop. 17,065; shops of four r.r. systems, cotton and flour mills, creosote works.
**Denison University.** At Granville, Ohio; co-ed., Bapt.; founded 1831; liberal arts, music, art, preparatory dept.
**Denmark,** one of the three Scandinavian kingdoms of n.w. Europe; pop. 3,250,000; 16,585 sq. mi.; cap. Copenhagen; **994–7, 3906,** *maps,* **997, 1196–7;** coöperative societies, **879, 996, 880, 2908;** foreign trade, **996, 880, 1540, 1724;** govt., **996, 3779;** Greenland, **1539–40;** industries and products, **994, 996, 880, 2900;** language and literature, **3134;** physical features, **994, 996, 321, 2528;** relations with Iceland, **1724.** —*History,* **997, 3134;** Northmen, **2525–8;** Canute, **639;** war with Hanseatic League (1368), **1576;** union with Sweden (1397), **3404;** in Thirty Years' War, **3488–9, 757;** Great Northern War, **698;** slave trade abolished, **3249;** Napoleonic Wars,

**1073, 880, 321**; loses Norway, **997, 2536**; loses Schleswig-Holstein, **428, 757**; sells Virgin Isls. to U.S., **3651**.

RULERS OF DENMARK SINCE THE UNION OF KALMAR

DENMARK, SWEDEN, AND NORWAY

| | |
|---|---|
| 1397-1412 | Margaret and Eric VII (Eric XIII of Sweden) |
| 1412-38 | Eric VII (alone) |
| [1438-40 | Interregnum] |
| 1440-48 | Christopher III |
| 1448-81 | Christian I |
| 1481-1513 | John |
| 1513-23 | Christian II (Sweden revolts and becomes independent 1523) |

DENMARK AND NORWAY

| | |
|---|---|
| 1523-1533 | Frederick I |
| 1533-1559 | Christian III |
| 1559-1588 | Frederick II |
| 1588-1648 | Christian IV |
| 1648-1670 | Frederick III |
| 1670-1699 | Christian V |
| 1699-1730 | Frederick IV |
| 1730-1746 | Christian VI |
| 1746-1766 | Frederick V |
| 1766-1784 | Christian VII |
| 1808-1839 | Frederick VI (regent 1784-1808) (Norway annexed to Sweden, 1814) |

DENMARK

| | |
|---|---|
| 1839-1848 | Christian VIII |
| 1848-1863 | Frederick VII |
| 1863-1906 | Christian IX |
| 1906-1912 | Frederick VIII |
| 1912- | Christian X |

**Denominate numbers.** *See in Index* **Weights and measures.**

**Denomina'tions,** religious, **2994.**

**Density,** of earth, **1064**; specific, **1508–9.**

**Dent, Julia B., 1498.**

**Den'tine,** tooth substance, **3452,** *picture,* **3453.**

**Dentistry, 997–8**; anesthetics, **125**; use of platinum, **2831**; X-rays, **3826.** *See also in Index* **Teeth.**

**Denton,** Tex. City 35 mi. n.e. of Fort Worth; pop. 7626; agricultural trade; College of Industrial Arts, North Texas State Normal College.

**Denver, James W.** (1817–92), Amer. general and frontiersman, **998.**

**Denver,** Colo., cap. and largest city; pop. 256,491; **998,** *pictures,* **841**; juvenile court, **1906.**

**Denver, University of,** at University Park, Colo., and Denver, Colo.; co-ed., Meth. Episc.; founded 1864; liberal arts, law, dentistry, commerce, teachers' college; **998.**

**Department,** Fr. govt. division, **1350.**

**Department of Agriculture** (U.S.). *See in Index* **Agriculture, Department of.**

**De Pauw University.** At Greencastle, Ind.; Meth. Episc., co-ed.; founded 1837; liberal arts, music.

**DePere** (*dē-pēr'*), Wis., city on Fox R.; early mission at, **3772.**

**Depew', Chauncey M.** (born 1834). Amer. lawyer and politician; especially noted for his brilliant wit as an after-dinner speaker; b. Peekskill, N.Y.

**Depth bomb,** *picture,* **3796.**

**Dep'uties, Chamber of,** France, **1351.**

**De Quin'cey, Thomas** (1785–1859), Eng. essayist and critic; master of gorgeous rhythmic prose ('Confessions of an English Opium Eater'); **1167.**

**Derbend'** or **Derbent,** anc. city on Caspian Sea 150 mi. n.w. of Baku; pop. 35,000; largely Mohammedan; **654, 664.**

**Derby, Edward G. Stanley,** 14th **Earl of** (1799–1869). Brit. statesman, ardent supporter of Reform Act of 1832; prime minister 1852, 1858–59, 1866–68; translated 'Iliad'.

**Derby, Edward George Stanley,** 17th **Earl of** (born 1865). Eng. Conservative leader, House of Commons 1892–1906; director-general of recruiting, 1915–16; sec. of state for war 1916–18; ambassador to France, appointed 1918.

**Derby, Frederick Arthur Stanley,** 16th **Earl of** (1841–1908). Eng. statesman and colonial administrator; held various offices in Disraeli and Salisbury cabinets, gov.-gen. of Canada 1888–93 (as Baron Stanley of Preston).

**Derby,** Conn. Town 9 mi. w. of New Haven on Housatonic and Naugatuck rivers; pop. 11,238; brass and iron goods, pianos and organs, machinery, keys, guns, ammunition.

**Derby,** England, county seat of Derbyshire, 120 mi. n.w. of London on R. Derwent; pop. 129,000; china and silk mfrs.; **2883.**

**Derby.** The most famous horse-racing event in England; held annually at Epsom Downs, 15 mi. s.w. of London.

**Derbyshire,** a n.-midland county of England, 1030 sq. mi.; pop. 700,000; mfg., mining, agriculture; **3200.**

**De Resz'ke.** *See in Index* **Reszke.**

**Dermes'tid,** a skin-devouring beetle, **370.**

**Dermis** or **derm,** true skin, **3245.**

**Dermot Mac Mur'rough** (1110?–71). King of Leinster, pivot of first Eng. intervention in Ireland (1135–71); dethroned because he had carried off another chieftain's wife, sought aid of Henry II.

**Dernburg** (*dĕrn' bŭrĸ*), **Bernhard** (born 1865). Ger. business man and administrator, head of Ger. propaganda in the United States during first years of World War.

**Der'ringer pistol, 1256.**

**Dervish.** A member of Mohammedan religious fraternity living in a monastery or wandering as a mendicant.

**Derwent River,** in Cumberland, England, flows into Irish Sea; expands into Derwentwater, a small oval lake in s. Cumberland noted for its scenic charm; influenced Wordsworth, **3788.**

**Descartes** (*dā-kärt'*), **René** (1596–1650), Fr. philosopher and mathematician; founder of Cartesian system and of analytic geometry; "father of modern philosophy"; **2773**; philosophy ridiculed by Voltaire, **3661.**

**'Descent from the Cross',** by Michelangelo, *picture,* **2220.**

**'Descent of Man',** by Darwin, **964.**

**Deschanel** (*dā-shä-nĕl'*), **Paul Eugène Louis** (1856–1922). Fr. statesman, orator, and writer; Liberal leader; president of France 1920.

**Deschutes** (*dā-chŭt'*) **River,** Ore., rises in s. in Cascade Mts.; flows n. 320 mi. to Columbia R.; *map,* **2596.**

**Desdemona** (*dĕz-dĕ-mō'nà*), heroine of Shakespeare's 'Othello', **2603–4.**

**Deseret** (*dĕz'ē-rĕt*), Mormon state in Utah, **2327.**

**'Deserted Village, The',** poem by Oliver Goldsmith, **1484, 1166.**

**Deserts,** in Algeria, *picture,* **3122**; Arabian, **165, 167–8**; Asia, **228, 230, 3104**; Australia, **262**; camels, **588–91**; caravans, *pictures,* **233, 3106**; Chile, **736**; Egypt, **1092–3**; Gobi, **228, 2285**; Libyan, **1093**; mirage, **2260–1**; Persia, **2734**; Sahara, **3104–6, 33**; Turkestan, **3555–6**; U.S., **3580, 3584, 970, 200**; vegetation, **4, 202, 562, 966, 1207, 2829.**

**Deside'rius,** last king of Lombards (ruled 756–774), **689.**

**Des Moines** (*dā moin*), cap. and largest city of Iowa; pop. 126,468; **998–9**; mural paintings in, **911**; capitol, *picture,* **1805**; govt., **1806.**

**Des Moines River,** rises in s.w. Minnesota and flows 450 mi. s.e. through Iowa to Mississippi R.; *map,* **1804.**

**Des Moines University.** At Des Moines, Iowa; co-ed., Bapt.; founded 1852; liberal arts, engineering, normal work, pharmacy, music, oratory, art.

**Desmoulins** (*dā-mu-lăñ'*), **Camille** (1760–94), Fr. politician and journalist; crying "To arms" as the news of Necker's dismissal reached the Paris crowds (1789), initiated Revolution; became alienated from Jacobins; guillotined; **961.**

**De Soto** (*dā sō'tō*), **Hernando** (1496?–1542), Span. explorer of s.e. U.S. and discoverer of Mississippi R., **999, 2265, 2198**; *maps,* **1296–7, 3605.**

**Despen'ser, Hugh le,** the Elder (1262–1326), Eng. nobleman, powerful, wealthy leader of the Baron's party opposing Edward II; almost alone opposed execution of Gaveston; later himself chief adviser of king; arrogance and rapacity of his son Hugh the Younger largely responsible for their fall; **1038.**

**D'Espérey** (*dĕs-pā-rā'*), **Louis Franchet** (born 1856), Fr. general; commanded 1918 allied offensive in Balkans; made Marshal of France in 1921; commander 5th army at Marne, **2151.**

**Des Plaines River,** in s.e. Wis. and n.e. Ill.; length 150 mi.; **1730, 1734**; Indian route, **725, 727.**

**Dessalines** (*dā-sä-lēn'*), **Jean Jacques** (1758–1806). "Jean Jacques I, emperor of Haiti" (1804–06), negro slave, insurrectionist general under Toussaint l'Ouverture, and barbarian despot; assassinated; **1561.**

**Des'tinn, Emmy** (born 1878). Bohemian operatic soprano ('Mignon'; 'Aïda'; 'Madame Butterfly'); made début in Berlin 1897; several seasons with Metropolitan Opera Co., New York City.

**Destroyer,** a war vessel, **2423, 3378, 3803.**

**Detec'tor, wireless,** audion, **3761, 3762, 257**; crystal, **3761**; magnetic, **3761.**

**Det'mold,** Germany. Cap. of former principality of Lippe, 47 mi. s.w. of Hanover; pop. 15,000; cloth mfrs.; colossal statue of Hermann or Arminius, who defeated Romans 9 A.D.

**Detroit',** Mich., city on Detroit R.; pop. 993,678; "automobile capital of the world"; **999–1000, 2224**; besieged by Pontiac, **1772, 2226**; in War of 1812, **2227, 3672**; train ferry to Windsor, *picture,* **2970.**

**Detroit, University of.** At Detroit, Mich.; men, Rom. Cath.; founded by Jesuits 1877.

**Detroit River,** connecting L. St. Clair and L. Erie, **1000, 1512, 1514**; *map,* **2226.**

**Dettingen** (*dĕt'ing-ĕn*). Village of Bavaria, Germany, on R. Main; decisive victory of Allies under George II of England over French under Duc de Noailles, June 27, 1743.

**Deucalion** (*dū-kā'lī-ŏn*), the "Noah" of Gk. myth., **1000.**

**Deule** (*dŭl*) **River,** France, tributary of the Lys, **2008.**

**Deuteronomy** (*dū-tĕr-ŏn'ò-mĭ*), the fifth book of the Bible; contains last injunctions of Moses to his people; account of the death of Moses; **2333.**

**'Deutschland',** Ger. submarine, **3378.**

**'Deutschland über Alles',** Ger. song, **2405.**

**De Valera** (*dā vä-lā'rä*), **Eamon** (born 1882). Sinn Fein leader; elected member Brit. Parliament 1917; president of the "Irish Republic" 1919–22; demanded absolute independence and opposed treaty establishing Irish Free State; resigned, Jan. 1922, after treaty ratified.

**Deventer** (*dĕv'ĕn-tĕr*), Netherlands. Quaint old town on Ysel R.; pop. 33,000; famous for "Deventer koek," a honey cake.

**DeVere, Aubrey Thomas** (1814–1902). Irish poet, inspired by Gk. spirit and by Irish legends; wrote devotional verse of high order ('Irish Odes'; 'Legends of St. Patrick'; 'Legends of the Saxon Saints'; 'St. Peter's Chains').

**Devia'tion,** of compass, **854.**

**Devil** or **Satan,** ruler of kingdom of evil, personification of spirit of evil; in Faust legends, **1227;** in 'Paradise Lost', **2244–6;** in Job, **1894.**

**Devil dancers,** *pictures,* **1750, 2118.**

**"Devil dogs,"** Ger. term for U.S. marines, **2149.**

**Devil-fish** or **sea-devil,** a ray, **3244;** name applied to giant squid, **942;** to octopus, **2559.**

**Devil's coach-horse,** a beetle, *pictures,* **369.**

**Devils Island,** in Atlantic, 30 mi. off coast of Fr. Guiana; Dreyfus imprisoned, **1547.**

**Devils Lake,** salt lake in N.D., **2522.**

**Devils Lake,** N.D. City on lake of same name, 89 mi. w. of Grand Forks; pop. 5140; creameries and grist mills.

**Dev'on,** breed of cattle; cows and bulls rather small; oxen grow to great size and are prized for work; **663.**

**Devo'nian period,** in geology, **1418,** *picture,* **1419;** called "Age of Fishes," **1418, 3196;** period of petroleum formation, **2750.**

**Dev'onport.** Fortified port on promontory in s.w. Devonshire; pop. 82,000; military and naval station; large dockyard and naval arsenal.

**Devonshire, Elizabeth, Duchess of** (1759–1824). One of the two beautiful duchesses of Devonshire painted by Gainsborough; Elizabeth's portrait was the famous "Stolen Duchess," lost 25 years.

**Devonshire, Spencer Compton Cavendish,** 8th **Duke of** (1833–1908). Eng. statesman, prominent in Victorian era; a Liberal but opposed Gladstone's Home Rule policy; leader of Liberal Unionists.

**Devonshire, Victor Christian William Cavendish,** 9th **Duke of** (born 1868). In House of Commons 1891–1908; civil lord of the Admiralty 1915–16; gov.-gen. of Canada, 1916–21.

**Dev'onshire,** county in s.w. peninsula of England; 2605 sq. mi.; pop. 650,000; contains granite tableland of Dartmoor; dairying, agriculture, mining, fisheries; cap. Exeter, **1160.**

**De Vries** (*dē vrēs'*), **Hugo** (born 1848), Dutch botanist; developed "mutation" theory of evolution, **1210–1.**

**Dew,** moisture condensed from air, **1000;** distinguished from fog, **1316.**

**Dewberry,** or trailing blackberry, **432;** hybrids, **2977.**

**De Wet** (*dē vĕt'*), **Christian** (1854–1922), Boer general, commander-in-chief of Free State forces in S. African War (1899–1902); rebelled at outbreak of World War (1914), was defeated and taken prisoner; **447.**

**Dewey, Charles Melville** (born 1849), Amer. landscape painter; usually depicts early morning and evening effects; highly individual and poetic in sentiment; **2634.**

**Dewey, Admiral George** (1837–1917), U.S. naval commander in Span.-Amer. War, **1000–1, 3307.**

**Dewey, John** (born 1859), Amer. philosopher and educator, put his theories of education into effect in children's school connected with Univ. of Chicago 1894–1904; prof. of philosophy at Columbia Univ. after 1904; as pragmatist, **2773.**

**Dewing, Thomas W.** (born 1851), Amer. figure and portrait painter; his paintings are usually small, refined in treatment, delicate in color; **2634.**

**De Witt** (*dē vĭtt'*), **Jan** (1625–72). Dutch statesman, grand pensionary for nearly 20 years; in domestic politics supported republicans against House of Orange; sought alliance with Louis XIV; lost influence when Fr. designs against Netherlands became apparent; killed by mob.

**Dew point, 1000;** hygrometer, **1717.**

**Dews'bury,** England. Town in Yorkshire, 8 mi. s. of Leeds; pop. 55,000; makes carpets, blankets, worsteds.

**Dex'trine,** an adhesive gum, **3344.**

**Dextro-rotatory light, 3438.**

**Dextrose** or **grape sugar, 3388, 1475.**

**Dhole** (*dōl*), wild dog of India; differs from wolf by hair between toes and shorter muzzle; **1748.**

**Dholpur** (*dōl-pụr'*). Native state of Rajputana, Brit. India; 1155 sq. mi.; pop. 263,000; agricultural section; cap. Dholpur (20,000).

**Di'abase** or **greenstone.** A granular igneous rock with lime-soda feldspar and pyroxene (augite) as its essential minerals; generally crystalline throughout; almost identical with basalt.

**Diabetes** (*dī-ȧ-bē'tēz*), **1470.**

**Diagno'sis** of disease, **2192.**

**'Dial, The',** organ of the Transcendental movement, **1142.**

**Dial, watch,** how made, **802.**

**Diam'eter,** of circle, **1423;** of earth, **1064;** as measure of magnifying power, **3463.**

**Diamond, 1001–5, 1409;** Arkansas mine, **207;** Brazilian mines, **494;** consists of carbon, **642, 1002;** crystalline nature, **207;** hardness scale, **2248;** Kohinoor, **1004, 2050,** *pictures,* **1004, 1005;** made radioactive by radium, **2960;** S. African fields, **3281, 3283, 41, 38, 641;** synthetic and imitation, **1410, 642;** used as drill points, **2248;** world stock, **1409.**

**Diamond** (baseball), **338.**

**Diamond, Cape,** on St. Lawrence R. at Quebec, **2948.**

**Diamond Necklace Affair.** Historic Fr. political scandal, contributory to Fr. Rev., and involving Marie Antoinette, in whose name the necklace had been fraudulently ordered through certain swindlers and their dupes.

**Diamond rattlesnake, 2978.**

**Diamond type, 3572.**

**Diana** (*dī-ăn'ȧ*), goddess in Rom. myth., identified with Gk. Artemis, **220–1;** Beauvais tapestry, *picture,* **3435.** *See also in Index* **Artemis.**

**Diana Ver'non.** Brilliant hoyden heroine of Scott's 'Rob Roy'.

**Diana, Temple of** (Ephesus), **3178,** *picture,* **3179.**

**Diana monkey, 2291.**

**Diaphragm** (*dī'ȧ-frăm*), of body, **1005, 2373;** in camera, **2783;** in photograph, **2774–6;** in telephone, *picture,* **3459.**

**Diarbekir** (*dī-är'bĕkr*), Turkey, town on Tigris R. about 200 mi. n.e. of Aleppo; pop. 38,000; silk goods, gold and silver filigree work; **3499.**

**Di'astase,** an enzyme, in malt, **2131.**

**Diastrophism** (*dī-ăs'trō-fĭsm*), the process of change in the shape of the earth's crust, **2787.**

**Diatom** (*dī'ȧ-tŏm*), a single-celled sea plant, **2558, 396;** an alga, **2822;** earthy deposits formed, **1050.**

**Diavolo, Fra** (*frä dē-ä'vō-lō*) ("Brother Devil") (d. 1806). Ital. brigand and renegade monk, subject of opera by Auber.

**Diaz** (*dē'äs*), **Armando** (born 1861). Ital. general, commander-in-chief of Ital. armies in World War.

**Diaz** or **Dias de Novaes, Bartholomew** (d. 1500), Port. navigator, discoverer of Cape of Good Hope, **3279, 640.**

**Diaz** (*dē-äz'*), **Narcisse Virgilio** (1807–76), Fr. landscape painter of Barbizon school, **2632.**

**Diaz** (*dē'äs*), **Porfirio** (1839–1915), president of Mexico, **1006, 2216–7, 3746.**

**Dick'cissel,** a bunting, **534.**

**Dickens, Charles** (1812–70), Eng. novelist, **1006–10, 2540, 1167;** experience with Amer. roads, **3024;** 'The Story of Tiny Tim', **760–2;** 'Mr. Pickwick and the Pickwick People', **1007–10.**

**Dickinson, Emily** (1830–86). Amer. poet, b. Amherst, Mass.; a recluse all her life, published almost nothing; lyrics published after her death aroused attention because of simplicity, originality of expression, and poignancy of feeling.

**Dickinson,** N.D., city 92 mi. w. of Bismarck; pop. 4122; **2525.**

**Dickinson College.** At Carlisle, Pa.; Meth. Episc., co-ed.; founded 1783; arts and sciences, law.

**Dickman, Joseph T.** (born 1857), maj.-gen. U.S. Army; commanded 3d Division, A.E.F., at St. Mihiel, **3110;** in Argonne, **194.**

**Dickson City,** Pa. Coal-mining center 5 mi. n. of Scranton; pop. 11,049; foundries, machine shops, and silk mills.

**Dicotyledons** (*dī-kŏt-ĭ-lē'dŏns*), plants with two-lobed seeds, **3173, 2831, 3940–3;** include most trees, **3533.**

**Dic'taphone, 1010, 2776.**

**Dicta'tor,** in anc. Rome, **3044;** Cincinnatus, **766;** Julius Caesar, **564.**

**Dic'tionary,** Dr. Johnson's, **1898–9;** Noah Webster's, **3711–2.**

**Dic'tograph, 1010.**

**Dictys** (*dĭk'tĭs*), in Gk. myth., **2731.**

**Diderot** (*dē-drō'*), **Denis** (1713–84), brilliant, witty, versatile, and prolific "Encyclopedist," **1365, 1367.**

**Di'do** or **Elis'sa,** legendary Carthaginian queen, founder of Carthage, **650;** and Aeneas, **29.**

**Die,** a metal stamp or mold, **3516;** in coin-making, **2282;** in medal-making, *picture,* **978.**

**Diedrichs** (*dē'drĭĸs*), **Otto von** (1843–1918). Ger. admiral, remembered for attempt (frustrated by firmness of Dewey and a Brit. admiral) to ignore Dewey's blockade of Manila (1898).

**Dieppe** (*dē-ĕp'*), seaport and summer resort of n. France on English Channel, 105 mi. n.w. of Paris; pop. 24,000; destroyed by English and Dutch in 1694; occupied by Germans in 1870–71; **2513.**

**Diesel** (*dē'zĕl*) **engine,** type propelled by unvaporized oil, **1406;** used in submarines, **3375–6.**

**Diet, Dietetics.** *See in Index* **Food; Food values.**

**Diet,** a formal assembly or meeting; name often applied to legislative assemblies of cent. and n. European countries; also the formal meetings of councillors of Holy Rom. Empire; of Frankfort, **1448;** of Spires, **2988;** of Worms, **2084.**

**Diethyl** (*dī-ĕth'ĭl*) **oxide,** or ether, an anesthetic, **125.**

**Dietrich** (*dē'trĭĸ*) **of Bern.** Name under which Theodoric the Great appears in the Nibelungenlied and other heroic Ger. legends.

**Differen'tial gear,** of automobile, **285–7.**

**Diffrac'tion grating,** of spectroscope, **3314.**

**Diffusion,** the mixing of two liquids or two gases when brought into contact; of gases, **1403.** *See also in Index* **Osmosis.**

**'Digest'** of Justinian, **1905.**

**Digestion, 1010–1,** *pictures,* **2794–5;** action of enzymes, **1172–3, 1469;**

function of liver, **2031**, of stomach, **3360**; pepsin, **2724**; studied with X-rays, **3826**.
**Digger Indians,** group of tribes living in s.w. U.S., **1767**.
**Digger wasp, 3692–3.**
**Digitigrade** (*dĭj'i-ti-grād*) **animals,** or "toe walkers," **1322**; evolution seen in horse, **1683,** *picture,* **1682.**
**Dijon** (*dē-zhôṅ'*). Fortified town in e. France; former cap. of Burgundy; pop. 77,000; fine churches; univ.; various mfrs.; mustard, wine; occupied by Germans in 1870.
**Di'ka-nut,** seed of the wild mango, **2546.**
**Dikes** or **dykes,** earth embankments usually used to protect low lands from inundations of streams or of the sea; in Belgium, **372, 1048;** Guiana, **1546;** Holland, **1827, 2433, 1191–2,** *pictures,* **1191, 2442;** Mississippi R., **2268, 2262, 2068, 2469;** in Nova Scotia, **2538.**
**Dill,** a seasoning plant of the parsley family, **3319.**
**Dillon,** Mont., city 55 mi. s. of Butte; pop. 2701; **2312.**
**Dill pickle, 3319.**
**Dimity.** A fine cotton fabric with a reversible stripe or bar which is raised on one side where it is depressed on the other; name originally applied to a heavy fabric of the same type made in Spain for bed hangings.
**Dinant** (*dē-näṅ'*). Town in Belgium on Meuse R. 48 mi. s.e. of Brussels; pop. 8000; once noted for copper ware; sacked by Burgundians in 1466, by French, 1554, 1675; captured and burned by Germans, Aug. 23, 1914.
**Dinar'ic Alps,** mountains in w. Jugo-Slavia; highest point Dinara (6008 ft.); **1190,** *map,* **308.**
**D'Indy** (*dăṅ-dē'*), **Vincent** (born 1851). Fr. musical composer; pupil and follower of César Franck; noted for rich and subtle instrumentation ('La Forêt Enchanteé').
**Dingley Tariff Act, 3437.**
**Din'go,** Australian wild dog, **266.**
**Dinosaurs** (*dī'nō-sąrz*), extinct reptiles, **132–8, 2997.**
**Din'widdie, Robert** (1693?–1770), Brit. official, lieut.-gov. of Va. 1752–58; strenuous supporter of Fr. and Indian War; **3675.**
**Di'ocese,** a bishop's district, **763.**
**Diocletian** (*dī-ō-klē'shăn*) (245–313 A.D.), Rom. emperor (284–305), able soldier, and energetic ruler, under whom a memorable persecution of Christians took place; baths of, **3052;** division of empire, **3048;** palace at Spalato, **273;** postal service, **2896.**
**Diodo'rus Sic'ulus** (d. about 20 B.C.), Gk. historian, **1538.**
**Dioecious** (*dī-ē'shŭs*), **plants, 1305.**
**Diogenes** (*dī-ŏġ'ĕ-nēz*) (412–323 B.C.), Gk. Cynic philosopher, **1011–2.**
**Diomedes** (*dī-ō-mē'dēz*), one of Gk. heroes of Trojan War, **155, 248, 3542.**
**Diomedes,** in Gk. myth., king of Thrace; slain by Hercules, **1640.**
**Dionys'ius the Elder** (432?–367 B.C.), tyrant of Syracuse; type of cruel despot; pardons Damon and Pythias, **957;** and Plato, **2832;** "sword of Damocles," **957.**
**Diony'sus,** in Gk. myth., god of vine and growing principle of Nature; Rom. Bacchus; **1012;** Gk. festivals, **1031–2;** theater of, **3482, 251;** and Midas, **2230;** statue of Hermes and infant Dionysus, *picture,* **3156.**
**Diophan'tus,** Gk. mathematician of 3d or 4th cent. A.D., "father of algebra," **93.**
**Di'orite,** a very hard rock, **1100.**
**Dioscuri** (*dī-ŏs-kū'rī*). "Sons of Zeus," epithet of **Castor and Pollux.**
**Diphtheria** (*dĭf-thē'rĭ-à*), a contagious disease; caused by bacteria, **1450,** *picture,* **1452;** cured by antitoxins, **151, 152.**
**Diplod'ocus,** a huge prehistoric reptile, **134.**
**Diplomatic service, 1012–3;** papal, **2666.**
**Dip'lopod,** a class of arthropods including millepedes ("thousand legs"), **3946.**
**Dipneusti** (*dĭp-nūs'tī*) or **Dipnoi,** the lungfish sub-class, **2365.**
**Dipper,** a constellation, **872,** *charts,* **239, 873.**
**Dipper.** A small bird of the family *Cinclidae,* with an almost straight sharp-pointed bill and water-proof plumage; frequents clear pebbly streams and lakes of both Old and New Worlds, dipping and diving into the water; in U.S. found in Rocky Mts. region.
**Dipper dredge, 1040.**
**Dipping needle.** A magnetic needle used for measuring the magnetism of the earth at different places; it is balanced above a dial horizontally and dips toward a vertical position in proportion to the power of magnetism exercised; horizontal only at magnetic equator.
**Dipro'todon,** extinct Australian marsupial, *picture,* **266.**
**Dip'tera,** insect order containing two-winged types, **1788;** includes flies, **1313;** mosquitoes, **2338.**
**Dip'ylon gate,** in anc. Athens, **195.**
**Direct current** (D.C.), electricity flowing continuously in one direction, **1114;** derived from alternating current by audion, **257;** in dynamos, **1051,** *pictures,* **1051;** in motors, **1125;** in radio receivers, **3761;** used by electric street railways, **3371.**
**Directory, French,** committee of 5 which held executive power in France 1795–99, succeeding the Convention, **1370;** appoints Napoleon commander, **2392;** and Talleyrand, **3430;** XYZ Affair, **3826;** overthrown by Napoleon, **2393–4, 1370.**
**Direct primary, 2915.**
**Direct tax, 3441.**
**Dirigible** (*dĭr'i-ġi-bl*) **balloons** or **airships, 313–20.**
**Disappointment, Cape,** northern headland of Columbia R. mouth, **2596.**
**Disciples of Christ,** often called Campbellites, Christian religious denomination, founded 1830 by Thomas and Alexander Campbell; seek restoration of apostolic Christianity; total membership 1,280,000; **2994.**
**'Discobolus'** (*dĭs-kŏb'ō-lŭs*) or **'Discus Thrower',** statue by Myron, **1530,** *picture,* **1204.**
**Discount, bank,** how to figure, **2725–6.**
**'Discovery',** Capt. Scott's ship, **3150.**
**Disease, 1449–52, 2192–3;** of brain, **491–2;** children's, **1714;** defective teeth cause, **998;** germ theory, **1449–52, 2192;** of heart, **1617;** not "inherited," **1644;** insect carriers, **1788, 1292, 1312–3, 2334–8, 3546–7;** overheating causes, **1621;** parasites, **1679, 3813–4;** lack of vitamins a cause, **3651–2.** *See also in Index* **Germ Theory of Disease; Medicine and surgery.**
**Disil'icate of sodium,** or "water glass," **3272.**
**Disinfectants, 151.**
**Dismal Swamp,** marsh 30 mi. by 10 mi. in s.e. Va., extending into N. C.; partly reclaimed; Dismal Swamp Canal, important waterway connecting Chesapeake Bay with Albemarle Sound; **3647,** *map,* **3650;** peat bog, **2704.**
**Displacement of ships, 3220.**
**Disraeli** (*dĭz-rā'lĭ*), **Benjamin, Earl of Beaconsfield** (1804–81), novelist and statesman, twice prime minister of Ct. Brit., **1013;** primrose, **2915;** rivalry with Gladstone, **1468;** Victoria favors, **3640.**
**Dissent'ers,** those who refused to comply with usages of Church of England, **2937.** More recently the term has been supplanted by "non-conformist" or "free churchman."
**Dis'taff,** staff used in hand spinning, **3326.**
**Distaff spindle,** a shell, *picture,* **3203.**
**Distemper** or **tempera,** colors in painting, **2629.**
**Distilla'tion, 1014;** of alcohol, **84;** camphor, **594;** coal-tar, **814;** nature of process, **84;** petroleum, **2753–4.**
**Distinguished Conduct Medal,** Brit. decoration, **978.**
**Distinguished Service Cross,** U.S., **976;** British, **979;** *pictures,* **977.**
**Distinguished Service Medal** (D.S.M.), U.S., **976,** *pictures,* **977.**
**Distinguished Service Order** (D.S.O.), British, **978,** *picture,* **977.**
**Distribution,** of plants and animals. Same as **Ecology.**
**District courts,** U.S., **909.**
**District of Columbia,** federal district containing Washington, cap. of U.S.; on e. bank of Potomac between Md. and Va.; **3685–6;** slave trade prohibited, **855–6.**
**Disulphide,** a compound of two sulphur atoms with an element or compound; of carbon, **3390;** of iron (iron pyrites), **3390, 1817.**
**Ditching machine,** *picture,* **1040.**
**Ditch skater,** an insect, foot, *picture,* **1784.**
**Dith'yramb,** hymn in honor of Dionysus; origin, **194.**
**Diu** (*dē-ų'*), small Port. isl. off w. coast of India, **1756.**
**Diver.** Name applied to various species of loon.
**Dives** (*dī'vēz*) (Latin, "rich"). Popular name of rich man in the biblical parable of Lazarus and the rich man (Luke xvi, 19–31).
**Divide.** In physical geography, ridge or height of land separating the headstreams of one drainage system from those of another.
**Divide, the Great.** Same as **Continental Divide.**
**Div'idend,** in arithmetic, **1015;** stocks and bonds, **3358–9.**
**Dividing engine, 2227.**
**Div'i-div'i,** seed-pods of a S. Amer. tree, **1976.**
**'Divine Comedy',** poem by Dante, **958–61, 1832.**
**"Divine right" of kings, 1860, 1861.**
**Diving, 1014–5, 3410–2,** *pictures,* **2782, 2702;** greatest depth attained; **2554,** *picture,* **51.**
**Diving beetles, 370–1,** *picture,* **367.**
**Diving bell, 1015.**
**Diving birds** (*Pygopodes*), **412.**
**Divining rod, 1611.**
**Division,** in arithmetic, **1015–7;** algebra, **95, 96;** calculating machines, **572;** decimals, **972–4;** fractions, **1339, 1340, 1341;** in finding percentage, **2724.**
**Division,** an army unit, **218.**
**Dix, Dorothea Lynde** (1802–87). Amer. reformer, b. Hampton, Me.; supt. of women hospital nurses during Civil War; effected great improvements in condition of criminals, paupers, and the insane in Europe and U.S.
**Dix, John Adams** (1798–1879). Amer. statesman and soldier, b. Boscawen, N.H.; sec. of treasury (1860); issued famous order: "If any one attempts to haul down the American flag, shoot him on the spot"; gov. N.Y. 1873–75.
**Dixie,** origin of name, **2164.**
**'Dixie',** Southern song, **2405.**
**Dixie Highway, 3026.**
**Dixmude** (*dēs-müd'*). Town of Belgium on Yser Canal, 15 mi. s.w. of Ostend; captured by Germans, Nov. 10, 1914.

**Dixon, Jeremiah,** Eng. surveyor, **2164.**
**Dixon, Thomas** (born 1864). Amer. novelist and playwright, b. Shelby, N.C. ('The Leopard's Spots'; 'The Clansman').
**Dixon,** Ill., city on Rock R., 98 mi. w. of Chicago, pop. 8191; Lincoln and Davis at, **967.**
**Dnieper** (*nē'pĕr*), large navigable r. of s.w. Russia and Ukraine, rising in govt. of Smolensk, flowing s.e. and s.w. 1410 mi. to Black Sea; fisheries; **3085, 3089, 3575, 434.**
**Dniester** (*nēs'tĕr*), r. of s.e. Europe; rises in Carpathian Mts., flows s.e. 865 mi. to Black Sea; rich in fish; **3575, 434.**
**Doane College.** At Crete, Neb.; co-ed., Cong.; established 1872; liberal arts, music, elocution, art.
**Dobbin, William.** In Thackeray's 'Vanity Fair', bashful kind-hearted officer, friend of Osborne, whose widow, Amelia, he marries.
**Dobrudja** (*dō-brụ'djä*) or **Dobrogsa,** agricultural dist. in s.e. Rumania along Black Sea; 9000 sq. mi.; pop. 382,000; **3080, 3081, 962.**
**Dobson, Austin** (1840–1921). Eng. poet and essayist; delicate satire and graceful handling of artificial Fr. verse forms ('Proverbs in Porcelain'; 'Old World Idylls'; 'At the Sign of the Lyre').
**Dobugal shells, 549.**
**Dock.** A coarse weedy herb of the genus *Rumex*, from 2 to 4 ft. high; flowers small and greenish, growing in panicles; leaves usually long and lance-shaped.
**Dock family** (*Polygonaceae*), includes rhubarb, **3013.**
**Docks.** *See in Index* **Harbors and docks.**
**Doctor** (university degree), **831;** of medicine, **827;** of philosophy, **828.**
**Dod'der,** a parasitic plant introduced into U.S. from Europe with clover seeds; now a rapidly growing pest; **2680.**
**Dodec'anese** ("12 islands"), small isls. of the Sporades group in Aegean Sea; ceded by Italy to Greece, **3626.**
**Dodge, Mary Mapes** (1838–1905). Amer. editor and writer for children, b. New York City; editor of *St. Nicholas;* wrote 'Hans Brinker or The Silver Skates', 'Donald and Dorothy', 'The Land of Pluck'.
**Dodgson, Charles Lutwidge.** *See in Index* **Carroll, Lewis.**
**Do'do,** an extinct bird of Mauritius, **1017.**
**Dodo'na,** anc. city of Epirus; oracle of, **991.**
**Dods'ley, Robert** (1703–64), Eng. author and publisher ('Select Collection of Old Plays'; 'The Muse in Livery'); published Johnson's dictionary, **1898.**
**Doe,** a female deer, **979.**
**Dog, 1018–25;** in Belgium, **374;** care as pet, **2755–6, 1292;** classification, **1023;** dingo of Australia, **266;** dhole of India, **1748;** Eskimo, **1020,** *pictures,* **1175, 1176;** eye, *picture,* **1215;** first domesticated animal, **668;** foot, **1322;** Landseer's famous paintings, **1961,** *picture,* **2641;** law of color inheritance, **1642;** 'Story of Greyfriars Bobby', **1024–5;** in World War, **1018–9.**
**Dogbane.** A reddish-stemmed herb with milky juice and red-and-white flowers.
**Dogbane** family of plants, **3943;** includes oleander, **2577.**
**Dogberry.** In Shakespeare's 'Much Ado About Nothing', constable, type of official stupidity.
**Dog days,** origin of name, **872.**
**Doge** (*dōj*), elective duke or chief magistrate of the city-republics of Venice and Genoa during Middle Ages. **3624, 3625.**
**Doge's Palace,** at Venice, **3623,** *picture,* **1851.**
**Dog family,** the *Canidae,* **1023;** altitude range, **397.**
**Dogfish,** a shark, **3196, 3197,** *picture,* **1273;** egg, *picture,* **1091.**
**Dogger** (*dŏg'ẽr*) **Bank,** extensive sandbank near middle of North Sea, **2528;** battle in World War, **3810.**
**Dogskin gloves, 1475.**
**Dog Star** or **Sirius,** the most brilliant star, **3342;** *charts,* **3343, 873.**
**"Dog teeth,"** or canines, **3452,** *picture,* **3453.**
**Dogtooth violet** or **adder's-tongue,** plant of lily family, **1025, 3645.**
**Dogwood,** a hard-wooded shrub, **1025;** classified, **3533;** sumac, **2852.**
**Doheny, Edward L.** (born 1856), Amer. capitalist, b. Fond du Lac, Wis., **2211.**
**Dol'drums,** belt of calms near equator, **3750,** *picture,* **3751;** daily thundershowers, **2972.**
**Dole, Sanford Ballard** (born 1844), pres. of Hawaiian Republic 1894–1900; gov. Territory of Hawaii 1900–03; U.S. district judge of Territory 1903–15; **1605.**
**Dolichocephalic** (*dŏl-ĭ-kō-sẽ-făl'ĭk*) ("long-headed"), in ethnology, **2956.**
**Dollar,** the monetary unit of value in the U.S. and Canada, established as such in the U.S. by the Coinage Act of 1792; before that date Span. dollars were used in the colonies; in the 15th cent. large silver coins struck off in Joachimsthal, Bohemia, were called "thalers," from which through the low Ger. "daler" the word "dollar" came into use; gold dollar declared the standard in U.S. (1900), **2281, 2282.**
**Dolls, 1025–6, 3521–3;** Egyptian, *picture,* **3522;** hair made from spun glass, **1472;** Japanese doll festival, **1872;** Navajo Indian, *picture,* **204.**
**'Doll's House, A'.** Ibsen's drama, in which Nora, the "child-wife," finding her "doll's house" no longer a shelter for her ideals, goes out from it to grow up.
**Dolly Varden.** In Dickens' 'Barnaby Rudge', the locksmith's coquettish daughter, whose dress of flowered dimity gave its name to goods so figured.
**Dolly Varden trout, 3545.**
**Dol'mens,** monuments, **3361.**
**Dolomite** (*dŏl'ō-mīt*), a limestone, **2010.**
**Dol'omites** (from mineral dolomite), limestone mts. in s. Tyrolese Alps; highest peak Marmolata (10,972 ft.); **3573–4.**
**Dolphin** (*dŏl'fĭn*), sea mammal related to whale, **1026–7;** and Arion (Gk. myth.), **194;** a cetacean, **3723;** a dolphin "pilot," **131;** distinguished from porpoise, **2884.**
**Dolphin-fish** or **coryphene,** a large bony fish exhibiting beautiful changes in color when dying, **1027.**
**Dombrowa** (*dŏm-brōv'ȧ*), Poland, mining town 40 mi. n.e. of Cracow, **2857.**
**Dome,** in architecture, principle, **174;** Byzantine, **178,** *picture,* **182;** Florence, **1848,** *picture,* **1294;** Roman, **177, 178,** *picture,* **181;** St. Peter's, *picture,* **187.**
**Domenichino** (*dō-mā-nĭ-kē'nō*), **Zampieri** (1581–1641). Ital. painter, excelled in religious frescoes; one of earliest landscape painters; with Guido Reni most distinguished follower of the Carracci; 'Communion of St. Jerome', 'Scourging of St. Andrew', and 'Adam and Eve' his masterpieces.
**Domes'day Book,** William I's statistical record of England, **3739.**
**Domestic science.** *See in Index* **Home economics.**
**Dom'ett, Alfred** (1811–87). Eng. poet and colonial statesman; lived life of leisure in London for 10 years and was intimate with Browning; prime minister of New Zealand 1862–71; 'Ranolf and Amohia' best known of his works.
**Dom'inic, Saint** (1170–1221), Span. priest, founded Dominican Order of Preaching Friars; buried at Bologna, **450.**
**Domin'ical letters, 574.**
**Dominican** or **Black Friars, 2300;** carry on Inquisition, **1780.**
**Dominican Republic.** Same as **Santo Domingo.**
**Dominion Day.** Canadian national holiday, July 1, to celebrate anniversary of the formation of the Dominion, which came into being July 1, 1867.
**Domitian** (*dō-mĭsh'ăn*) (51–96 A.D.), Rom. emperor (81–96), murdered for his cruelties; the Apostle John was probably banished to Patmos during his reign; **3047, 1173.**
**Domrémy-la-Pucelle** (*dôn-rā-mē-là-pū-sĕl'*), village in n.e. France on Meuse R.; birthplace of Joan of Arc, **1893.**
**Don** (*dŏn*), river in s. Russia, rises in L. Tura, flows s.e. and s.w. 1325 mi. into Sea of Azof; navigable for 800 mi.; valuable fisheries; 37 mi.-canal connects with Volga R.; **3084, 3085, 434,** *maps,* **1196–7, 434.**
**Don** or **Dun,** river in Yorkshire, England; navigable for 39 mi. below Sheffield; **3200.**
**Donatello** (*dŏn-ä-tĕl'lō*) (1386?–1466), Florentine sculptor whose works are supreme expression of spirit of the early Renaissance, **3158;** bas-relief by, *picture,* **3157.**
**Donation of Constantine, 870.**
**Donati's** (*dō-nä'tē*) **Comet,** discovered by Giovanni Donati, 1858; 45,000,000 mi. long by 10,000,000 wide; last seen in 1859; **850.**
**Don Car'los, Don Juan,** etc. *See in Index* **Carlos; Juan.**
**Don Cossacks, 896, 3084.**
**Donegal** (*dŏn-ẽ-gạl'*). Extreme n.w. county of Ireland; 1871 sq. mi.; pop. 169,000; cap. Lifford; agriculture, fisheries, woolen mfrs.
**Donetz** (*dō-nyĕts'*), river in s. Russia, flowing s.e. 670 mi. to join Don R.; basin, minerals, **3086–7, 3575.**
**'Don Giovanni'** (*dŏn ǰō-vän'nē*). Mozart's opera, of which Don Giovanni (Don Juan) is hero; **2363, 2584, 3181.**
**Don'gola leather,** sheepskin or goatskin tanned to resemble French kid; invented by James Kent, Gloversville, N.Y.; **1977.**
**Donizetti** (*dō-nē-dzĕt'tē*), **Gaetano** (1797–1848). Ital. operatic composer; wrote 70 operas; combined an endless flow of melody with dramatic talent and power of humorous characterization; most popular operas are 'Lucia di Lammermoor', 'La Fille du Régiment', 'Don Pasquale', 'L'Elisir d'Amore'.
**Don'jon** or **dungeon, 656,** *picture,* **655.**
**Donkey** or **ass, 235–6.**
**Donne** (*dŏn*), **John** (1573–1631). Eng. poet and preacher; in youth wrote poetry, garbed in fantastic language, of which he was later ashamed; 'Satires', his most important contribution, probably earliest Eng. poems of their kind; at 41 took orders, became dean of St. Paul's and most popular preacher of his day.
**Don'nybrook.** A part of the city of Dublin; famous for its fair, started 1204, held annually, notorious for its attendant fighting and debauchery; abolished 1855.
**Dono'ra,** Pa. Borough 35 mi. s. of Pittsburgh on Monongahela R. in coal-mining and agricultural region; pop. 14,131; makes steel products, chemicals.

**'Don Quixote'** (*dŏn kwĭks'ōt*, Span., *dōn kē-hō'tā*), book by Miguel Cervantes, **682**; story retold, **683–4.**
**"Don't give up the ship," 1972.**
**"Doodle-bug,"** or ant-lion, **152.**
**Dooley, Mr.** Humorous Irish-American saloon-keeper, character created by Finley Peter Dunne. *See in Index* **Dunne.**
**Doon.** River of Ayrshire, Scotland, flowing n.w. 30 mi. into Firth of Clyde; immortalized by Burns ('The Banks o' Doon').
**Dop'pler's principle,** law in physics discovered 1842 by Christian Doppler (1803–53), **3277.**
**Dora.** In Dickens' 'David Copperfield', David's "child wife."
**Dora'do.** Same as **Dolphin-fish.**
**Dorado, El.** *See in Index* **El Dorado.**
**Dora Ripa'ria River,** Italy, rises in Cottian Alps; 60 mi. long; **3555.**
**Dor'cas** or **Tab'itha.** Disciple of Jesus at Joppa, a woman "full of good works" (whence the "Dorcas societies" of the church), raised from the dead by Peter (Acts ix, 36–40).
**Dor'chester, Guy Carleton, Baron.** *See in Index* **Carleton.**
**Dorchester,** England. Cap. of Dorsetshire; pop. 10,000; Rom. remains; Jeffrey's "Bloody Assize," 1685, sentencing 292 to death for participation in Monmouth Rebellion.
**Dordogne** (*dōr-dō'nyĕ*) **River,** in s.-cent. France 305 mi. long; unites with Garonne, **1345.**
**Dordrecht** (*dôr'drĕĸt*) or **Dort,** Netherlands, port on Merwede R. 12 mi. s.e. of Rotterdam; pop. 54,000; first assembly of independent states of Holland, 1572; Synod of Dort (1618–19) upheld Calvinism; trade in wine and lumber; shipyards; **2440.**
**Doré** (*dō-rā'*), **Gustave** (1832–83), Fr. painter and illustrator, famous for vivid imagination and grotesque humor with which he illustrated the world's classics; among these Balzac's 'Contes Drolatiques', Dante's 'Divine Comedy', Milton's 'Paradise Lost', and the Bible; 'Wandering Jew', **3669;** Satan and Beëlzebub, *picture*, **2245.**
**Doria** (*dō'rĭ-ä*), **Andrea** (1466–1560). Genoese admiral and patriot, soldier of fortune under Francis I of France and Emperor Charles V; drove French from Genoa and set up republic of which he became perpetual censor; exercised predominant influence until his death.
**Do'rians,** one of four great branches of Gk. people; took name from Dorus, son of Hellen; came from n. or n.w. and invaded Corinth, then Crete; Spartans always regarded as representatives of unmixed Dorian blood; **1520.**
**Dor'ic,** dialect in anc. Greece, **1538.**
**Doric** style in architecture, **177,** *picture*, **180,** color plate facing **176.**
**Dormant,** in heraldry, **1639.**
**Dor'mouse,** a small arboreal rodent, **1027;** giant fossil type, **138;** hibernating, *picture*, **1646.**
**Dorothe'a.** Heroine of Goethe's 'Hermann und Dorothea', a simple story of German village life.
**Dorpat** (*dôr'pät*) (Russ. Yuriev). Town in e. Livonia, 163 mi. s.w. of Petrograd; pop. 60,000; famous for univ. founded by Gustavus Adolphus (1632); town founded 1030, important in Hanseatic League.
**Dorr** (*dôr*), **Thomas Wilson** (1805–54), Amer. politician; leads rebellion in R.I., **3009–10.**
**D'Orsay** (*dōr-sā'*), **Count Alfred** (1801–52). Fr. dandy and wit, friend of Byron and Countess of Blessington; skilful amateur painter and sculptor; long arbiter of literary and artistic London society.
**Dor'set, Thomas Sackville,** first **Earl of** (1530–1608). Eng. statesman and poet, one of leading advisers of Queen Elizabeth; carried death warrant to Mary, Queen of Scots; part author of 'A Mirror for Magistrates', probably most important work between Chaucer and Spenser; helped write 'Gorboduc', also called 'Ferrex and Porrex', first Eng. tragedy.
**Dorset** or **Dorsetshire,** England. On English channel; 988 sq. mi.; pop. 217,115; agriculture, stock-raising, stone-quarrying; cap. Dorchester.
**Dort,** Netherlands. Same as **Dordrecht.**
**Dortmund** (*dôrt'mŭnt*), Germany. Largest city in Westphalia, 73 mi. n.e. of Cologne in center of coal basin; pop. 295,000; first mentioned in 899, later one of leaders of Hanseatic League.
**Do'ry,** flat-bottomed fishing boat, **1283, 1284.**
**Doshisha University,** at Kyoto, Japan, **1946.**
**Dostoyefsky** (*dŏs-tō-yĕf'skĭ*), **Feodor** (1821–81), Rus. novelist; dealt with peasant life and social problems; chief works, **3098;** influence on modern novel, **3097, 2541.**
**Do'than,** Ala. Trade center 96 mi. s.e. of Montgomery; pop. 10,034; lumber, cotton, fertilizer.
**"Do This, Do That,"** game, **2834.**
**Douai** (*dọ-ā'*). Mfg. town in n. France, 18 mi. s. of Lille; pop. 36,000; captured by Germans in World War, Oct 1, 1914.
**Douai Bible, 389.**
**Douaumont** (*dọ-ō-môn'*), fortified hill and village near Verdun; World War battleground, **3629.**
**Double-bass violin,** stringed musical instrument, **3648, 2590,** *picture*, **2382.**
**Double entry,** in bookkeeping, **7.**
**Double refraction,** *picture*, **1999.**
**Double stars, 240.**
**Doublet,** a garment worn by men about 1600–1750, **898.**
**"Doubting Thomas," 157.**
**Dough-bird,** a curlew, **3261.**
**Dougherty, Denis J.** (born 1865). Amer. Rom.-Cath. cardinal, b. Philadelphia; was first Amer. bishop of Philippine Isls.; created cardinal 1918.
**Doughty** (*dou'tĭ*), **Arthur** (born 1860), Canadian historian and archivist, b. Maidenhead, Berkshire, England; went to Canada 1886; **625.**
**Doughty, Thomas** (1793–1856), Amer. landscape painter, **2634.**
**Doug'las.** A Scotch family famous in history, song, and legend. An earl of Douglas fell fighting against "Hotspur" Percy at Otterburn (1388). Douglas of Lochleven was jailer of Mary, Queen of Scots (1567–68).
**Douglas, Sir James** (1286–1330), "the Black Douglas." **518.**
**Douglas, Stephen Arnold** (1813–61), Amer. statesman, author of doctrine of squatter sovereignty, **1027;** debates with Lincoln, **2017, 2012;** introduces Kansas-Nebraska Act, **1913.**
**Douglas.** Town of s.e. Alaska on Douglas Isl. opposite Juneau; pop. 919.
**Douglas,** Ariz., mining and cattle-shipping center in s.e. corner, 20 mi. s.e. of Bisbee; pop. 9916; copper smelters, **202.**
**Douglas,** cap. of Isle of Man; pop. 22,000; **2134.**
**Douglas, Mt.,** in s. Mont., just n. of Yellowstone Park, **3036.**
**Douglas fir, 3332;** in Brit. Columbia, **512,** *picture*, **607;** timber, **3590.**
**Douglass, Frederick** (1817–95). Negro antislavery orator and journalist, b. Tuckahoe, Md.; once a slave, long chief leader of Amer. negroes.
**Douglas squirrel, 3334.**
**Doul'ton, Sir Henry** (1820–97), Eng. inventor and manufacturer of pottery, **2906.**
**Douro** (*dụ'rō*), river rising in n. Spain and flowing w., then s.w. along Port. border and w. through n. Portugal to Atlantic; 485 mi.; **2888.**
**Douw, Dou,** or **Dow, Gerard** (1613–80), Dutch painter, pupil of Rembrandt ('Woman Sick of the Dropsy'), **2440.**
**Dove, Arthur,** Amer. painter of ultra-modern tendencies, **2634.**
**Dove,** name applied to various pigeons, **1027;** mourning dove, *pictures*, **415, 2411.**
**Dover,** Del., state cap., 35 mi. s. of Wilmington in fruit-growing region; pop. 4042; fruit canning and evaporating plants; **987,** capitol, *picture*, **988.**
**Dover,** England, port on English Channel; pop. 44,000; **1027;** cable, **560;** Caesar's landing, **1152.**
**Dover,** N.H. Mfg. city on Cocheco R. 10 mi. n.w. of Portsmouth; pop. 13,029; textiles, iron and leather products; oldest city in state (1623).
**Dover, Strait of.** Channel connecting North Sea with English Channel and separating England and France 20 to 27 mi. wide; chalk cliffs on both sides.
**Dovre Mts.** or **Dovrefjeld** (*dō-vrē-fyĕld'*), range in cent. Norway; highest peak 7615 ft.; **2532.**
**Dow, Neal** (1804–97). Amer. temperance orator, b. Portland, Me.; author of Maine prohibition law.
**Dow'ie, John Alexander** (1848–1907). Amer. religious leader, b. Scotland; self-styled "Elijah the Restorer"; preached "faith healing"; founded Christian Cath. Church (1901) at Zion City Ill.
**Down,** plumage, **1228.**
**Downing Street,** London, **2054.**
**Downs,** in Australia, **2790.**
**Downs.** System of chalk hills in s.e. England; North Downs in Surrey and Kent; South in Sussex; latter feeding ground for famous Southdown sheep.
**Downy-headed woodpecker, 3781,** *pictures*, **416, 3780.**
**Downy mildews, 2236.**
**Doyle** (*doil*), **Sir Arthur Conan** (born 1859). Brit. novelist, creator of famous detective character Sherlock Holmes ('The Sign of the Four'; 'Adventures of Sherlock Holmes'); later became leader in spiritualist movement.
**Drachenfels** (*drä'ĸĕn-fĕls*), "Dragon's Rock," mountain in Germany, 10 mi. s.e. of Bonn, 1065 ft. high; castle, **3005.**
**Drachma** (*drăk'mà*). Gk. silver coin normally equal to 19½ cts. in U.S. money.
**Drachmann** (*drä'ĸmàn*), **Holger Henrik Herboldt** (1846–1908), Danish poet and dramatist, quoted, **996.**
**Draco** (*drā'kō*) (7th cent. B.C.), compiler of first written code of Athenian laws, **1521, 3274.**
**Draft.** A bill of exchange issued by one bank against another; often applied to all domestic bills of exchange. *See in Index* **Bill of exchange.**
**Draft,** military conscription; in Amer. Civil War, **779, 2498;** in World War, **3801–2.** *See also in Index* **Conscription.**
**Draft horses, 1684–5.**
**Draft riots,** New York City (1863), **779, 2498.**
**Draga** (Mme. Draga Mashin) (d. 1903), queen of King Alexander of Serbia; formerly lady-in-waiting to his mother Queen Natalie; **3177.**
**Dragon,** fabulous animal, **1027–8, 563, 3231.**

**Dragon,** small E. Indian lizard, **1028.**
**Dragon-fly,** insect sometimes called "darning needle," **1023–30;** duration of life, **126;** eye, **1213.**
**Dragon's blood,** a reddish brown resin; use in engraving, **1172.**
**Drainage,** household, **3183, 2840;** of land, **1828.** *See also in Index* **Irrigation and reclamation.**
**Drain-pipes,** how made, **505.**
**Drais, Karl von,** invents velocipede, **391.**
**Drake, Edwin L.** (1819–90), drills first oil well in Amer., **2750, 2752.**
**Drake, Sir Francis** (1540?–96), explorer and privateer, first Englishman to circumnavigate the globe, **1030–1,** *maps,* **110, 2115;** in Brit. Columbia, **513;** in Calif., **580;** captures Cartagena (Colombia), **835;** burns St. Augustine, **3107;** Spanish Armada, **210–1.**
**Drake, Joseph Rodman** (1795–1820). Amer. poet, b. New York City ('The Culprit Fay'; 'The American Flag'); subject of Fitz-Greene Halleck's eulogy:

"Green be the turf above thee,
Friend of my better days;
None knew thee but to love thee,
None named thee but to praise."

**Drake,** a male duck, **1044.**
**Drakensberg** (*drä'kĕns-bĕrg*) or **Drakenberge,** mountain range in s.e. Africa, **36.**
**Drake University.** At Des Moines, Iowa; co-ed.; opened 1881; liberal arts, law, medicine, normal work, music, pharmacy, dentistry.
**Dra'ma, 1031–9;** American, **1036, 1039;** copyright, **884;** comedy, origin of, **1031–2;** English, **1164, 1165, 1034, 1036;** great names in history of, **1038;** Greek, **1031–3, 1536–7;** influence of Ibsen, **1720, 1036;** Irish, **1814, 1036;** in Japan, *picture,* **1865;** in Middle Ages, **1033;** motion picture plays, **2344, 2346, 1039;** music-drama (Wagner's), **3663;** opera, **2584;** pageants, **2625–6;** puppet shows, **1039;** religious plays, **2259, 1033, 1436, 347;** Roman, **1966, 1033;** Shakespearean, **3188–94;** tragedy, origin, **1032;** theaters, **3482–5.** *See also in Index* **English literature; French literature;** etc.; also chief dramatists by name.
**Drama League of America.** Organization founded 1910 for encouragement of good plays and promotion of drama study.
**Drammen** (*drăm'ĕn*), Norway. Seaport at mouth of Drammen R., on arm of Christiania Fiord; pop. 26,000; exports timber; sawmills.
**Draughts** or **checkers, 707–8.**
**Drave** (*drä'vē*) **River,** rising in the Tyrol, flows s.e. between Hungary and Jugo-Slavia, joining Danube after 450 mi., **962, 1703.**
**Dravid'ians,** a people of India, **1748.**
**Drayton, Michael** (1563–1631). Eng. poet ('Poly-Olbion'; 'Battle of Agincourt').
**Dreadnought** (*drĕd'nôt*), war vessel, **2423,** *picture,* **2426.**
**Dreams, 3251.**
**Dredge-net,** *picture,* **1285.**
**Dredges, 1039–41, 1480,** *picture,* **1481.**
**Dred Scott Decision,** in U.S. history (1857), **1039, 777, 522, 2017.**
**Dreiser** (*drī'sĕr*), **Theodore** (born 1871). Amer. novelist, b. Terre Haute, Ind.; searching psychology and frank, sometimes crude, realism ('Sister Carrie'; 'Jennie Gerhardt').
**Drepa'num.** *See in Index* **Trapani.**
**Dresden** (*drĕz'dĕn*), Germany, cap. of Saxony, on Elbe R.; pop. 548,000; **1041.**
**Dresden china, 2883, 1041,** *pictures,* **2882.**
**Dress.** *See in Index* **Costume.**
**Dreux** (*drû*). Old town in n.w. France, 35 mi. s.w. of Paris; pop. 11,000; Huguenots defeated by Catholics under Duke of Guise, 1562; taken by Germans, 1870.
**Drew, Daniel** (1797–1879). Amer. capitalist and stock speculator, b. Carmel, N.Y.; early associate of "Jim" Fiske and Jay Gould; founder of Drew Theological Seminary.
**Drew, John** (born 1853). Amer. actor; son of John Drew, Irish-Amer. comedian; b. Philadelphia; among most noteworthy of many brilliant characterizations are Petruchio in 'The Taming of the Shrew', and Charles Surface in 'School for Scandal'.
**Drex'el, Anthony Joseph** (1826–93). Amer. banker, b. Philadelphia, Pa.; founder of Drexel Institute of Art, Science, and Industry, Philadelphia; son of Francis M. Drexel, founder of famous Philadelphia banking house.
**Dreyfus** (*drā-füs'*), **Alfred** (born 1869), Fr. (Jewish) military officer, center of the famous "Dreyfus case" which convulsed Fr. political life (1894–99); later cleared of treason charge, restored to his rank (1906) and promoted; Clemenceau defends, **787;** Zola defends, **3840;** on Devil's Isl., **1547.**
**Drift, glacial, 1466, 1721, 3273;** in Minn., **2253;** in N. Amer., **2516;** in Red R. valley, **2986;** in Wis., **3768.**
**Drill,** a machine tool, **3514;** diamond, **2248;** petroleum well, **2752,** *picture,* **2750;** pneumatic, **2847,** *picture,* **2847.**
**Drills,** shell fish, **2614.**
**Drinkwater, John** (born 1882). Eng. poet and playwright ('Abraham Lincoln').
**Drive,** in golf, **1486,** *picture,* **1485.**
**Driver,** a golf club, **1486.**
**Driver ants, 142.**
**Driving iron,** a golf club, **1486.**
**Drogheda** (*drŏ'kĕ-dȧ*), Ireland. Seaport on R. Boyne, 27 mi. n. of Dublin; pop. 12,000; "Poynings' Law," or "Statute of Drogheda," 1494; capture by Cromwell and massacre 1649; taken by William III 1690 after "Battle of the Boyne."
**Dromedary** (*drŭm'ē-dā-rĭ*), a one-humped riding camel, **591.**
**Drome** (*drōm*) **River,** tributary of Rhone, **3012.**
**Dromios** (*drō'mĭ-ōz*). Comic twins, attendants on the twins Antipholus of Ephesus and Antipholus of Syracuse in Shakespeare's 'Comedy of Errors'.
**Drone bees, 362,** *pictures,* **360, 361.**
**Drood, Edwin.** Hero of Dickens' unfinished novel 'The Mystery of Edwin Drood'.
**"Drop the Handkerchief,"** game, **2834–5.**
**Dropwort, water,** *picture,* **2853.**
**Dros'era,** the sundew genus of plants, **3396.**
**Drouth,** belt of, **2974;** caused by deforestation, **3532.**
**Drowned coast, 2790;** in N. Amer., **2517, 2482, 3647.**
**Drowned valley, 3023.**
**Drowning,** first aid for, **1268–9, 3412.**
**Drugs, 1041–2;** alkaloids, **10;** anesthetics, **124–5;** made from coal-tar, **814;** Michigan mfrs., **2226;** opiates, **2585;** patent medicines, **1715;** pure food and drug laws, **2936–7;** specific remedies, **2192–3.** *See also in Index* names of individual drugs.
**Drug-store beetle, 369–70.**
**Dru'ids,** priestly class among anc. Celts, **674;** autumn festival, **1566.**
**Drum,** of ear, **1056.**
**Drum,** a musical instrument, **1042, 2383, 2951,** *pictures,* **2382.**
**Drum'lins, 3770.**
**Drummond, Henry** (1851–97). Scotch religious writer and scientist ('Natural Law in the Spiritual World'; 'The Ascent of Man').
**Drummond, William Henry** (1854–1907), Canadian poet, **1042–3, 624.**
**Drummond Lake,** in s.e. Va., in Dismal Swamp, **3647.**
**Drummond** or **lime light, 2010.**
**Drunken Parliament, 2689.**
**Drupa'ceous fruits, 1380.**
**Drury College.** At Springfield, Mo.; co-ed.; founded by Congregationalists 1873; collegiate work, music, art.
**Druses** (*drọs'ĕz*), religious sect, **3426.**
**Dryads** (*drī'ădz*), in Gk. myth., wood nymphs, **2546.**
**Dryasdust.** An antiquary invented by Scott as lay figure in various novels. The name, made more famous by Carlyle, is applied to a prosy writer.
**Dry'den, John** (1631–1700), Eng. poet, critic, essayist, **1043, 1165, 1036;** first poet laureate, **2848.**
**Dry dock, 1579.**
**Dry farming, 641;** in Colo., **840;** Neb., **2430;** Nev., **2444;** Utah, **3610.**
**Drying oils, 1227.**
**Dry measure, 3715.**
**Dry Tortugas** (*tôr-tụ'gȧz*). Group of 10 coral keys in Gulf of Mexico 70 mi. w. of Key West and included in Florida; during Civil War Ft. Jefferson served as Federal prison; Carnegie Institution established marine biological laboratory 1904; entire group made federal bird reservation 1908.
**Dual Alliance.** Union formed between France and Russia 1891 by a secret treaty for common action in international matters.
**Dual Monarchy** (Austria-Hungary), **270–3, 1703, 1354.** For complete history *see in Index* **Austria.**
**Du Barry** (*bä-rē'*), **Marie Bécu, Countess** (1746–93). Fr. adventuress, followed Mme. de Pompadour as favorite of King Louis XV, over whom she had absolute influence; woman of seductive beauty, quick wit, gracious manners; beheaded by revolutionary tribunal.
**Dublin,** Ireland, cap. and largest city of Ireland; pop. 400,000; **1043,** *pictures,* **1810.**
**Dublin, University of,** or **Trinity College,** founded 1591; arts and science, divinity, law, medicine, engineering; open to women; fine library and manuscript collection; **832.**
**Dubois** (*dụ-bwä'*), **Paul** (1829–1905), Fr. sculptor and painter; his greatest work, in Renaissance spirit, is tomb of Gen. Lamoricière at Nantes; also noteworthy are statues of Joan of Arc at Reims and Montmorency at Chantilly; painted only portraits, **3158.**
**Dubois** (*dụ-bois'*), Pa. Industrial city 80 mi. n.e. of Pittsburgh, in coal-mining region; pop. 13,681; machinery, overalls, silks, pottery, coke.
**Dubuque** (*dụ-būk'*), **Julien** (1765–1810), French trader, **1806.**
**Dubuque,** Iowa, city on Mississippi R.; pop. 39,141; varied industries and important wholesale and jobbing trade; lead and zinc mining near by; univ.; **1806, 2268.**
**Dubuque, University of.** At Dubuque, Iowa; co-ed.; founded 1852; liberal arts, pedagogy; Presb. theological seminary.
**Duc'at.** Coin formerly used by various European countries; probably first struck by Byzantine emperors 11th cent.; golden ducats of Venice, particularly famous, worth about $1.50.
**Du Chaillu** (*dü shä-yü'*), **Paul Belloni** (1835–1903), Fr.-Amer. explorer, first white man to make scientific observations of the gorilla and African pigmies; wrote 'Explorations and Adventures in Equatorial Africa', and 'A Journey to Ashango-land', thrilling accounts of his adventures; **38.**

**Duck,** a flat-billed waterfowl, **1044–6;** classified, **412;** foot, *picture,* **1323;** hatching period, **408;** mallard, *picture,* **414;** migration, **2231;** related to swan, **3399.**
**Duckbill,** a mammal peculiar to Australasia, **1046–7, 2132;** egg, *picture,* **1091;** foot, *picture,* **1323.**
**Duckhawk,** or peregrine falcon, **1606.**
**Ducking-stool, 2919.**
**Duckweed,** a stemless water plant, **3700.**
**Duct,** of body gland, **1469;** bile, **2031, 1469.**
**Ductil'ity, 3757;** of gold, **1482;** of platinum, **2831;** of silver, **3242.**
**Ductless glands,** of body, **1469–70.**
**Dud'ley, Guildford** (d. 1544), husband of Lady Jane Grey; executed for part in plot against Queen Mary; **1542.**
**Dudley, Joseph** (1647–1720). Son of Thomas Dudley; pres. of Mass. council 1684-86; gov. 1702–15; "he had as many virtues as can consist with so great a thirst for honor and power."
**Dudley, Robert.** *See in Index* **Leicester, Earl of.**
**Dudley, Thomas** (1576–1653). Leader in colonial Mass.; except Winthrop most influential in colony; between 1629 and 1653 was deputy gov. for 14 years and gov. for 4; one of the founders of Cambridge.
**Dudley,** England. City in Worcestershire, 8 mi. n.w. of Birmingham in "Black Country"; pop. 56,000; coal and iron mining; makes iron and brass products.
**Du'els, 3422–3;** Burr-Hamilton, **543;** Clay-Randolph, **785;** Decatur-Barron, **971.**
**Duet** (*dū-ĕt'*), in music, **2584.**
**Du Fay, C. F. de C.** (1699–1739), Fr. physicist; discovered "positive" and "negative" electricity, **1117.**
**Duff, Alexander** (1806–78). First Church of Scotland missionary to India; initiated western education in India.
**Duf'ferin and A'va, Frederick Temple Blackwood,** first **Marquis of** 1826–1902). Brit. diplomat, gov.-gen. of Canada 1872–78, viceroy of India 1884–88, and at various times Brit. ambassador to Russia, Turkey, Italy, and France; in private and public life a conspicuous "great gentleman."
**Duffle bag, 596.**
**Du'gong,** an aquatic mammal, **2134.**
**Dug'out,** primitive boat, **446.**
**Du Guesclin** (*dü gā-klăn'*), **Bertrand** (1320?–80), Fr. general, constable of France, **1700, 694.**
**Duisburg** (*düs'bŭrG*), Germany. City in Rhenish Prussia, between Ruhr and Rhine rivers, with which it is connected by canal; pop. 245,000; coal and iron center.
**Duke** (Lat. *dux*), in Gt. Brit., a nobleman of the highest hereditary rank, excepting princes of the royal family; in Parliament, **2687.**
**Dukhobors** or **Doukhobors** (*dụ-kō'-bôrs*), religious sect, **3128, 3088.**
**Dulcinea** (*dŭl-sĭn'ē-à*), romantic name given by Don Quixote to his peasant "lady"; hence, a sweetheart; **683.**
**Duluth',** Minn., shipping center at head of L. Superior; pop. 98,917; **1047, 2254, 2256;** *picture,* **2257.**
**Duma** (*dụ'mä*), Rus. national assembly, **3092, 2506, 3094.**
**Dumas** (*dü-mä'*), **Alexandre** (1803–70), Fr. dramatist and novelist; author of 'The Count of Monte Cristo' and 'The Three Musketeers'; **1047–8, 2541,** *picture,* **1364.**
**Dumas, Alexandre,** the Younger (1824–95), Fr. dramatist, author of 'Camille', **1048.**
**Du Maurier** (*dü mō-ryā'*), **George L. P. B.** (1834–96). Brit. illustrator; gay little pictorial satires on society, chiefly published in *Punch*; also novelist ('Peter Ibbetson'; 'Trilby'; 'The Martian').
**Dumba, Constantin Theodor** (born 1856). Austrian ambassador to U.S. from 1913 until recalled by demand of U.S. govt. 1915 for violations of diplomatic propriety.
**Dumb waiter,** a form of elevator, **1132.**
**Dum'dum,** India. Town in Bengal, 5 mi. n.e. of Calcutta; pop. 21,000; first produced deadly dumdum bullets.
**Dumdum bullet, 1256.**
**Dumfries** (*dŭm-frēs'*), Scotland. City on R. Nith, 65 mi. s.w. of Edinburgh; pop. 19,000; burial place of Robert Burns; tweeds, hosiery, cattle markets.
**Dum** or **doom palm.** A species of palm with fan-shaped leaves and a stem repeatedly forked, an unusual feature among palms; native to Arabia, Egypt, and Cent. Africa; fruit red-skinned with a sweet brown spongy center, used as food.
**Düna,** also called Southern Dvina, river rising in w. Russia, near source of Volga, with which it is connected by canal; flows w. through Poland and Latvia into Gulf of Riga; length 650 mi.; *map,* **2858;** Riga, **3020.**
**Dünaburg** (*dü'nà-bŭrg*). Same as **Dvinsk.**
**Dunajec** (*dọn-ä'yĕts*) **River,** battle of (1915), **3810.**
**Dunant** (*dü-năn'*), **Jean Henri** (1828-1910), Swiss author and philanthropist, founder of Red Cross Society, **2983–4.**
**Dunbar, Paul Laurence** (1872–1906), Amer. negro poet, b. Dayton, Ohio (Lyrics of Lowly Life'; 'Poems of Cabin and Field'), **117;** quoted, **326.**
**Dunbar, William** (1465?–1525?), Scotch poet; Walter Scott said that he is "unrivaled by any which Scotland has produced"; disciple of Chaucer, but with wider humor and greater heat of blood ('Two Married Women and the Widow'; 'The Dance of the Deadly Sins'); **1164.**
**Dunbar,** Scotland, seaport on Firth of Forth, 25 mi. e. of Edinburgh; pop. 3400; historic old castle; Cromwell defeated Scots, 1651; battle of, **925, 3149.**
**Duncan** (d. 1040). Scotch king murdered by Macbeth.
**Duncan, Isadora** (born 1880). Amer. classical dancer, revived and popularized Gk. barefoot dances with simple, free draperies.
**Duncan, Norman** (1871–1916), Canadian journalist and author, **624, 1542.**
**Duncan Passage,** Andaman Isls., **1756.**
**Dundee',** 3d city in Scotland; important seaport on Firth of Tay, 36 mi. n.e. of Edinburgh; pop. 186,000; chief linen and jute mfrs. in Gt. Brit.; marmalade and shipbuilding; **2018, 3147.**
**Dundrear'y, Lord.** Caricature of a Brit. nobleman in Tom Taylor's comedy 'Our American Cousin'; made famous by Edward A. Sothern, revived by his son, Edward H. Sothern; it was at a performance of this play that Lincoln was shot.
**Dunedin** (*dŭn-ē'dĭn*), New Zealand, cap. and chief seaport in s.e. of South Isl.; pop. 73,000; woolen mfrs., gold mining; Otago Univ.; **2500.**
**Dunes,** sand, **3121–2;** Denmark, **994, 996;** Indiana, **1757,** *picture,* **1759;** of Sahara, **3104, 1093;** in Belgium, **372.**
**Dunferm'line,** Scotland, in county of Fife, 16 mi. n.w. of Edinburgh; pop. 28,100; famous for damask table linen; birthplace of Charles I and Andrew Carnegie; burial-place of Robert Bruce; **2018.**
**Dung-beetle,** a "tumble-bug," **369;** *picture,* **367.**
**Dunkers** or **Dun'kards;** the Church of the Brethren; hold the Bible to be the infallible word of God; faith, repentance, baptism the conditions of salvation; **2722.**
**Dun'kirk** (Fr. Dunkerque), France, seaport on the strait of Dover; pop. 40,000; shipbuilding and trade center, **1048.**
**Dunkirk,** N.Y. Commercial city 37 mi. s.w. of Buffalo on L. Erie; pop. 19,336; fine harbor and extensive lake trade; locomotives, steel.
**Dunmore', John Murray, Earl of** (1732–1809), Eng. colonial administrator, gov. of N.Y. 1770; gov. of Va. 1771–76; gov. of Bahamas 1787–96; "Lord Dunmore's War," **3181.**
**Dunmore,** Pa. Industrial borough 2 mi. e. of Scranton; pop. 20,250; in anthracite coal-mining dist.; brick, stone, and silk interests.
**Dunne** (*dŭn*), **Finley Peter** (born 1867). Amer. journalist and humorist, b. Chicago; famous for creation of "Mr. Dooley" ('Mr. Dooley in Peace and War'; 'Mr. Dooley's Philosophy').
**Dunsa'ny, Edward Plunkett, Baron** (born 1878). Irish story-writer and dramatist; fantastic and imaginative work ('The Gods of Pegana'; 'The Gods of the Mountain'; 'King Argimenes'; 'A Night at an Inn').
**Duns Sco'tus, John** (1265?–1308), Scotch theologian and philosopher, one of the greatest of the Schoolmen; a destructive critic as Thomas Aquinas was constructive; his followers became bigoted opponents of the New Learning; so the name of the learned "Subtle Doctor" came to mean a blockhead or "dunce"; **2773.**
**Dun'stan, Saint** (924–988 A.D.). Abbot of Glastonbury, archbishop of Canterbury and adviser to kings Edmund I and Edgar of England; first of a long line of Eng. ecclesiastical statesmen.
**Dunwoody Institute.** At Minneapolis, Minn.; established 1914; **2252.**
**Duodec'imal system,** in arithmetic, **2542.**
**Duodec'imo,** a book size, **458.**
**Duode'num,** the first portion of the small intestine between the stomach and the jejunum, encircling the pancreas, **2794.**
**Dupleix** (*dü-plĕks'*), **Joseph François, Marquis** (1697–1764), greatest Fr. gov. in India; failure as empire-builder due to lack of support by Fr. govt. against his Eng. rival Clive and Brit. East India Co.; recalled to France (1754), died in obscurity and want; **1753, 3180.**
**Duplex telegraphy, 3456;** applied to cables, **558.**
**Du Pont de Nemours** (*dụ pôn dẽ nẽ-mụr'*), **Pierre Samuel** (1739–1817), Fr. statesman and economist; imprisoned and property confiscated in Fr. Rev.; immigrated to U.S. His son, Eleuthère Irénée (1771–1834), established the famous Du Pont powder works, **3743.**
**Dupré** (*dü-prā'*), **Jules** (1812–89), Fr. landscape painter, one of chief members of the Barbizon school of romantic landscape painters, **2632.**
**Duquesne** (*dü-kān'*), Pa. Iron and steel mfg. city 10 mi. s.e. of Pittsburgh on Monongahela R.; pop. 19,011.
**Duquesne, Fort.** *See in Index* **Fort Duquesne.**

**Duralu'min,** an alloy of aluminum, **104, 314.**
**Durance** (*dü-räṅs'*) **River,** France, rises in Fr. Alps, flows 215 mi. to Rhone, **3012;** canal to Marseilles, **2154.**
**Durango** (*dụ-răn'gō*), Mexico, state in n.-center; 42,272 sq. mi.; pop. 510,000; cap. Durango (33,000); iron ore, **2210–1.**
**Durazzo** (*dụ-räd'zō*), chief seaport of Albania; pop. 5000; **80.**
**Dur'ban** or **Port Natal,** chief seaport in province of Natal; one of finest cities in S. Africa; pop. 80,000; **2398.**
**Durbar** (*dēr'bär*), **991.**
**Durendal** (*dŭ-rĕn-däl'*), sword of Roland, **3038.**
**Dürer** (*dü'rēr*), **Albrecht** (1471–1528), "prince of Ger. artists," **1048–9, 2630;** compared with Holbein, **1673;** home in Nuremberg, **2543;** method of engraving, **1168.**
**Dur'ham, John George Lambton,** first **Earl of** (1792–1840). Brit. gov.-gen. of Canada (1838); his 'Report on the Affairs of British North America' "one of the greatest state papers in the English language," outlined scheme which later resulted in present Dominion of Canada, and laid down the principles of Brit. colonial policy which have since prevailed; helped draft the Reform Bill of 1832.
**Durham,** maritime county of n.e. England; 1015 sq. mi.; pop. 1,400,000; shipbuilding, iron-working; coal, **2449.**
**Durham,** England, county seat of Durham County, in n.e. on Wear R.; pop. 18,000; celebrated cathedral; castle built by William the Conqueror; univ.; **1160.**
**Durham,** N.C., city in n.-cent. part, 22 mi. n.w. of Raleigh; pop. 21,719; Trinity College; cotton goods, hosiery, paper bags; tobacco mfrs., **2519.**
**Durham,** N.H. Seat of N.H. College of Agriculture and Mechanic Arts, 30 mi. e. of Concord; pop. 750.
**Durham cattle.** A short-horned breed noted for beef quality.
**Durham's Station,** N.C., battleground of Civil War near Durham, scene of Johnston's surrender to Sherman, **2521.**
**Du'rian,** tall forest tree resembling the elm; spherical fruit 6 to 8 inches in diameter; seeds, about the size of chestnuts, are roasted and eaten; **2130, 3227.**
**Duroc',** a coarse sturdy breed of swine, *picture,* **1670.**
**Dur'ra,** a sorghum, **3276.**
**Dur-Sargon,** anc. city near Nineveh, **2510.**
**Du'rum wheat, 2093, 3732.**
**Duruy** (*dü-rwē'*), **Jean Victor** (1811–94). Fr. historian and educator; minister of education (1863–69); wrote histories of France, Rome, Greece.
**Duryea** (*dŭr-yā'*), **Charles E., 276.**
**Duse** (*dụ'zā*), **Eleonora** (born 1859). Ital. tragic and emotional actress of international reputation ('Juliet'; 'Francesca da Rimini'). Many of Gabriele D'Annunzio's plays were written for her.
**Düsseldorf** (*düs'ĕl-dôrf*), Germany, industrial city and port on Rhine R., 22 mi. n.w. of Cologne; in Westphalian coal region; pop. 410,000; center of art and music; birthplace of Heine; **1443.**
**Dust,** effect on light rays, **52;** fog formation, **1316;** volcanic, **3657.**
**Dust explosions, 1212.**
**Dutch clover, 810.**
**Dutch East India Company, 1072;** colonies in S. Africa, **3279, 640;** sends Hudson to America, **1690.**
**Dutch East Indies,** territory in Malay Archipelago subject to Netherlands, including Sumatra, Java, part of Borneo, Celebes, Moluccas, etc.; 683,000 sq. mi.; pop. 47,000,000; **1070, 1072,** *maps,* **1072–3, 232–3;** spices, **3317, 2545.** *See also in Index* names of chief islands.
**Dutch Guiana** (*gē-ä'nȧ*) or **Surinam,** Dutch colony on n.e. coast of S. Amer.; 46,000 sq. mi.; pop. 110,000; **1546–7,** *map,* **3288–9.**
**Dutchman's breeches.** A spring wild flower (*Dicentra cucullaria*), of the n. and e. U.S.; named from odd shape of its cream-colored blossoms, which hang in clusters from long stalks growing directly from the root.
**Dutch metal,** an alloy, **881.**
**Dutch Netherlands, 2442.** For history, *see in Index* **Netherlands.**
**Dutch New Guinea,** w. half of isl. of New Guinea, **2451–3.**
**Dutch oven, 3368.**
**Dutch painting, 2630–1.**
**Dutch West India Company,** established 1621 with monopoly of trade on Amer. and African coasts; New Amsterdam, **2496, 3374.**
**Dutch West Indies.** Dutch Guiana and Curaçao.
**Duty** (tariff), **3437.**
**Duval** (*dụ-vȧl'*), **Claude** (1643–70). Eng. highwayman, famous for daring and politeness; robbed "gentlemen of their purses and ladies of their hearts"; hanged at Tyburn.
**Duveneck** (*dū'vĕ-nĕk*), **Frank** (born 1848). Amer. painter, etcher, and sculptor, b. Covington, Ky.
**Dux'bury,** Mass., old town on Massachusetts Bay, 30 mi. s.e. of Boston; settled by Miles Standish, William Brewster, and John Alden in 1631; **3338.**
**Dvina** (*dvē-nä'*), r. in n. Russia, formed by Sukhona and Jug; flows 780 mi. n.w. into White Sea; **1188.** Name Southern Dvina is sometimes given to the Düna River.
**Dvinsk** (*dvĭnsk*) or **Dünaburg.** City in s.e. Latvia; pop. 110,000; former Rus. fortress; r.r. center; linen and flax; sawmills.
**Dvorák** (*dvôr'zhäk*), **Antonin** (1841–1904), Bohemian musical composer and conductor; noted for use of Slavic, Negro, and Indian folk melodies; chief works, **2381.**
**Dwarfs,** in Africa, **3280;** in folklore (fairies), **1219, 816;** Lilliputians in 'Gulliver's Travels', **3407–9;** Tom Thumb, **510.** *See also in Index* **Pigmies.**
**Dwarf** or **mountain sumac, 3391.**
**Dwight, Timothy** (1752–1817). Amer. Cong. minister, educator, and writer, b. Northhampton, Mass.; pres. Yale College (1795–1817).
**Dyaks** (*dī'ăks*), aborigines of Borneo, **467–8, 2881.**
**Dyce, William** (1806–64). Brit. painter, associated with Pre-Raphaelite school.
**Dyes and dyeing, 1049–50;** alizarine, **814;** aniline, **814, 1779;** coal-tar, **814, 384;** cochineal, **817, 3133;** indigo, **1777;** lemon juice, **1986;** logwood, **2046–7;** mordants, **104;** from nettles, **2443;** tamarind, **3432;** Tyrian purple, **3201, 2774;** used by Amer. Indians, **205.**
**'Dying Gaul'** or **'Dying Gladiator',** famous Gk. statue, **1532.**
**Dykhtau** (*dĭĸ'tou*), **Mt.,** in Caucasus, **663.**
**Dyle** (*dīl*) **River,** Belgium, **2073.**
**Dynam'ics,** mechanics of motion, **2189;** Galileo's contributions, **1392.**
**Dy'namite, 1050, 1211, 1212, 2511.**
**Dy'namo, 1050–2, 1108, 1113, 1114,** *pictures.* **1124, 1797;** "D.C." and "A.C." types, **1114;** in hydroelectric installation, *picture,* **3695;** principle discovered by Faraday, **1224, 1121;** produces "current" electricity, **1108, 1113.**
**Dyne** (*dīn*). A unit of force in physics; the force which acting on a gram for one second would give it a velocity of one centimeter a second.
**D'Youville College.** At Buffalo N.Y.; women, Rom. Cath.; founded 1898; arts and sciences, music.
**Dys'entery,** intestinal disease accompanied by fever and loss of blood; amoebic form caused by protozoa, **1450.**
**Dyson, Edward** (born 1865), Australian poet, **268.**
**Dyspro'sium,** a rare chemical element, **4042.**

# E

CAN you find a sentence in this encyclopedia in which the letter E does not occur? Of all the letters in the English alphabet E is the one most used. We should not know how to get along without it. And yet the Egyptians and the Phoenicians didn't have it in their alphabets. Its ancestor,  however, was the Egyptian  which was simply the sign of a breathing. When later it was written  it looked like our E turned down. The Phoenicians called it *He* (pronounced *hā*), meaning "window," which seems a pretty good name for a breathing sound, although it is rather hard to see its resemblance to a window in form. The Phoenicians and Hebrews changed the form of it still  further, turning the stem up. But they wrote from right to left and so they faced it toward the left like this  The Greeks, who wrote from left to right just as we do, turned it around. They were the first to use it as a vowel. In English we give the name of the letter the long "ee" sound. But in the other languages using the Roman alphabet its name is pronounced "ay," which is its original long sound. The *e* sound does not occur in English as frequently as the letter, for in a great many words the letter is silent, being used often to lengthen a preceding vowel (compare, for example, *at* and *ate*, *bit* and *bite*); and sometimes it is used without serving any purpose of pronunciation, as in *gone*, *live*, *give*.

**Eads** (*ēdz*), **James Buchanan** (1820–87), Amer. engineer, b. Lawrenceburg, Ind.; built Civil War river ironclads which captured Ft. Henry; Eads Bridge over the Mississippi, **3109**; Mississippi jetties, **1888**.

**Eagle,** bird of prey, **1053–6, 131**; bald, *picture*, **415**; eye, *picture*, **1215**; foot, *pictures*, **409, 1323**; length of life, **126**; national emblem, **1053, 1853**; 'The Story of "Old Abe," the War Eagle', **1055–6**.

**Eagle,** U.S. gold coin, **2259**.

**Eagle,** Prussian orders of the, **979**.

**Eagre** (*ē'gēr*), a tidal "bore," **3497**, *picture*, **3498**.

**Ear, 1056–7,** *picture*, **3277**; dislodging foreign body, **1270**; earache, **1270, 1714**; grasshopper, **1504**; how sounds reach it, **3276**; insects, **1787**; limits of audibility, **3278**; mosquito antennae, **2336**; rudimentary in fish, **1274**.

**Earache, 1270, 1714**.

**Eared pheasant,** *picture*, **410**.

**Earl** (*ērl*). In Gt. Brit., a title and rank of nobility, third in the order of peerage, between marquis and viscount.

**Earlham College.** At Richmond, Ind.; co-ed.; founded 1847 by Society of Friends; organized as college 1859; arts and sciences.

**Early, Jubal Anderson** (1816–94), Confederate Civil War general, b. Franklin County, Va.; opposed secession of Va., but accepted commission in Confederate army; distinguished himself at Antietam, Fredericksburg, Chancellorsville; Jan. 1863 promoted maj.-gen.; commanded division at Gettysburg; campaigns in Shenandoah valley, **3204–5**.

**Ear shell,** an abalone, **3202,** *picture*, **3203**.

**Earth, 1058–64,** *Study Outline*, **3861**; age, **1060, 1420**; atmosphere, **50–3**; equinox and solstice, **1173**; formation of physical features, **2787–92**; history revealed by geology, **1417–22**; ice age, **1720–1**; latitude and longitude, **1968–9, 2061**; Magellan circumnavigates, **2115, 2116,** *picture*, **1061**; magnetic properties, **1064, 854, 2122**; mapping, **2142–3, 1968, 3397–8**; nebular hypothesis, **2319**; northern hemisphere, *picture-map*, **1414–5**; orbit, **1063,** *diagram*, **2816**; origin and evolution, **1209, 2818–9, 1417, 1058–60**; planetesimal theory, **2819**; population, **2956–7**; rotation and revolution, **1063–4, 2323, 1556**; seasons, **1063**; shape, **1060, 1416, 2932**; size, **1062–3, 1064, 3394, 2318,** *pictures*, **2321, 3393, 2816**; in solar system, **239, 242–3, 880, 2815, 3395**; tides, **3496–8, 2323**; weight, **1064**; winds, **3750–1**.

**Earthenware,** pottery, **2903–7**.

**Earthquake, 1064–6**; in Andes Mts., **3284**; Cent. Amer., **679–80, 1546, 3119**; Italy, **1066, 1840**; Japan, **1863, 1064, 1066**; Kingston, **1859**; Lisbon, **2026, 1065, 1066**; New Madrid, **2272, 1065–6**; Philippines, **2765**; San Francisco, **3124**; part played by volcanoes, **3658**.

**Earthworm,** or angleworm, **1066–8**; breathing, **2998**; classification, **3813, 3945**; hibernation, **1646,** *picture*, **1647**; tubular hearts, **1615**; story, 'Mr. Earthworm Tells His Own Story', **1067–8**.

**Earwig,** an insect, **3946**; method of defense, **1784–5**.

**East Africa, 1068–70, 34, 36,** *maps*, **1069, 40–1**; natives, *picture*, **33**.

**East An'glia.** Early kingdom in e. of Anglo-Saxon Britain, comprising present counties of Norfolk and Suffolk.

**East Auro'ra,** N.Y. Village 15 mi. s.e. of Buffalo; colony of Roycrofters, founded by Elbert Hubbard, produces handmade furniture, pottery, books.

**East Chicago,** Ind., port on L. Michigan, 19 mi. s.e. of Chicago; pop. 35,967; extensive rail and lake shipping; iron and steel products, from bolts to locomotives; oil refineries; **1760**.

**East Cleveland,** Ohio. Residential suburb 5 mi. e. of Cleveland; pop. 27,292; large summer estate of John D. Rockefeller.

**Easter,** Christian church festival, **1070**.

**Easter Island,** in S. Pacific Ocean; 45 sq. mi.; belongs to Chile, **1070**; archeological remains, **2618–9,** *picture*, **2619**.

**Easter lily, 2008, 2009,** *picture*, **1071**.

**Eastern Empire.** Same as **Byzantine Empire**.

**Eastern Orthodox church.** *See in Index* **Greek Orthodox church**.

**Eastern Question** in European politics, the complicated problems arising out of European interference in the affairs of Turkey and the Balkan states formerly under Turkish rule; in Balkans, **308, 309–10**; Crimean War, **922**; national boundaries after World War, **3812**; Turkey, **3559–60, 871**.

**Eastern Star, Order of, 1361**.

**Eastern Sun, Order of the, 979**.

**Eastern time, 3500**.

**"Eastern Townships"** of Quebec, **2945**.

**Easter Revolt,** abortive attempt of Irish to throw off Brit. rule; much of Dublin seized Easter Monday (1916); **1043, 1811**.

**East Goths.** *See in Index* **Ostrogoths**.

**East Ham,** England. *See in Index* **Ham, East and West**.

**Easthampton,** Mass. Town 12 mi. n.w. of Springfield; pop. 11,261; large dyeing and mercerizing plant; cotton and yarn mills, rubber goods factory; Williston Seminary for boys.

**East Hartford,** Conn. Town 2 mi. e. of Hartford on Connecticut R., with r.r. shops and paper mills; pop. 11,648; tobacco and vegetables grown near by.

**East India Company,** Danish, **1073**.

**East India Company,** Dutch, **1072, 3279, 640, 1690**.

**East India Company,** English, **1072, 3317, 1753, 1754**; Calcutta settled, **573**; Clive's services, **796**; French power in India broken, **3180**; Warren Hastings, **1596**.

**East India Company,** French, **1072–3**.

**East Indies** or Malay Archipelago, **1070, 1072–3, 2129,** *maps*, **1072–3, 2624–5, 232–3, 264–5**; bananas, **324**; climate, **2974, 3751**; coffee, **822**; ebony, **1073**; Malays, **2956,** *picture*, **2957**; rubber, **3072**; spices, **3317–9, 2723**.

**Eastland,** Tex. Town 125 mi. s.w. of Dallas; pop. 9368; rapid growth due to discovery of oil.

**East Liverpool,** Ohio, 45 mi. w. of Pittsburgh on Ohio R.; pop. 21,411; largest center in U.S. for mfr. of porcelain; **2570**.

**Easton,** Pa. City on Delaware R. at mouth of Lehigh, opposite Phillipsburg, N.J.; pop. 33,813; in cement, slate, coal, and iron region; mining implements, railroad supplies; Lafayette College founded 1826.

**East Orange,** N.J. Residential city 3 mi. w. of Newark and 12 mi. w. of New York City; pop. 50,710; pharmaceutical supplies.

**East Providence,** R.I. Mfg. town on Seekonk R. opposite Providence; pop. 21,793; oyster fisheries, electrical, chemical, and wire works.

**East Prussia,** easternmost province of Prussia, on Baltic Sea; 14,286

sq. mi.; pop. 2,230,000; cap. Königsberg; now separated from rest of Germany by Danzig Corridor; *map*, **1440**; invaded in World War, **1650**, **3794**.

**East River,** N.Y., strait separating Long Isl. from Manhattan Isl., 15 mi. long, **2487–8**.

**East St. Louis,** Ill., r.r. and mfg. center on Mississippi R.; pop. 66,767; **3109**, **1736**.

**East Youngstown,** Ohio. Village 4 mi. e. of Youngstown near n.e. border; pop. 11,237; iron mfrs.

**Eaton, Theophilus** (1591–1658), one of organizers of New England Confederation (1643); drew up code of laws called "Connecticut Blue Laws"; settled New Haven, **2456**.

**Eau Claire** (*ō clêr*), Wis., chief city in n.w. of state, 77 mi. e. of St. Paul, on Chippewa and Eau Claire rivers; pop. 20,906; **3772**.

**Eau de Cologne** (*ō dē kō-lōn'*), **834**.

**E'bal, Mt.,** in Palestine, opposite Mt. Gerizim, 3077 ft. high, **2643**.

**Eba'no,** oil center in Mexico, w. of Tampico, **2211**, **2212**.

**Ebenezer** (*ĕb-ē-nē'zēr*) ("stone of help"). Place in Judea where Samuel with divine assistance defeated Philistines (I Sam. vii, 10–12).

**Ebers** (*ā'bērz*), **Georg Moritz** (1837–98). Ger. Egyptologist and novelist ('An Egyptian Princess'; 'Uarda').

**Ebert, Friedrich** (born 1871). Ger. statesman, leader Social Democratic party, elected first pres. of Ger. Republic (1919), **1445**.

**Eb'ony,** tropical tree with black heart-wood, **1073**; Borneo, **468**; burns with difficulty, **1250**; Mexico, **2213–4**.

**Ebro** (*ē'brō*), river of n.e. Spain; flows s.e. 465 mi. from Cantabrian Mts. to Mediterranean; *map*, **3300**.

**Ecbatana** (*ĕk-băt'ā-nà*), Persia, anc. cap. of Media; modern Hamadan; **2734**.

**Eccen'tric,** of steam engine, **3351**.

**Ecclefechan** (*ĕk-l-fĕκ'ăn*), village in Scotland, 14 mi. e. of Dumfries; birthplace of Carlyle, **645**.

**Ecclesiastes** (*ē-klē-zi-ăs'tēz*) ("the preacher"). A book of the Old Testament attributed by Jewish tradition to Solomon.

**Ecclesias'ticus,** apocryphal book of Bible, **390**.

**Echegaray** (*ā-chā-gä-rī'*), **José** (1833–1916), Span. mathematician, statesman, and exceptionally popular dramatist; sharer of Nobel prize in 1904; **3307**; chief works, **1038**.

**Echelon** (*ĕsh'ĕ-lŏn*) **spectroscope, 3314**.

**Echeneis** (*ĕk-ē-nē'ĭs*), a fish, used in turtle catching, **3563**.

**Echidna** (*ē-kĭd'nà*), "spiny anteater" of Australia, an egg-laying mammal, **1047**, **2132**, *picture*, **266**.

**Echinoderms** (*ē-kī'nō-dĕrmz*), a group of marine animals, **127**, **3945**; evolutionary position, *diagram*, **128**; sea-cucumber, **3165**; starfish and sea-urchins, **3345**.

**Echmiadzin.** Same as **Etchmiadzin.**

**Echo** (*ĕk'ō*), in myth., **1073**, **2397**, *picture*, **1074**.

**Echo,** a reflected sound, **1073–4**; how avoided in buildings, **3278**; how produced, *picture*, **3277**.

**Echo River,** in Mammoth Cave, Ky., **665**.

**Eck, John** (Johann Maier von Eck) (1486–1543), Ger. theologian, one of most active opponents of Luther and Reformation, **2085**, **1985**.

**Eck'ermann, Johann Peter** (1792–1854). Ger. writer, friend and literary executor of Goethe ('Conversations with Goethe').

**Eckhardt** (*ĕk'härt*) or **Eckhart,** "the Faithful." Old man in Ger. legend who warned of evils those who followed Frau Holle or Holde (Venus); sometimes companion of Tannhäuser.

**Eckhart, Johannes** ("Meister Eckhart") (1260?–1327?), Ger. Dominican monk, father of Ger. mysticism.

**Eclipse** (*ē-klĭps'*), in astronomy, **1074–5**, **2318**.

**'Eclogues'** (*ĕk'lŏgs*), pastoral poems by Vergil, **3630**.

**Ec'nomus, Mt.** Hill on s. coast of Sicily; Regulus in famous naval battle vanquished Carthaginians 256 B.C.

**Ecol'ogy,** science of life relations to environment, **1076**, **473**, **475**, **127**; altitude range of animals, *picture*, **397**; distribution of birds, **404**; of trees, **3533**; division between Australian and Asiatic life ("Wallace's line"), **1072–3**, **404**, **228**; effect of climate on plant life, **795**; peculiar mammals of Australia, **1908**, **265–6**; plant "societies," **473**, **3700**; preponderance of animals in sea, **396**; primitive life forms precede the higher, **2340**, **1994**; protective coloration, **2923–6**, **1784**, **1274–5**, **411–2**. *See also in Index* **Adaptation.**

**Econom'ic botany,** defined, **473**.

**Economic geography,** defined, **1416**.

**Econom'ics,** or political economy, science of the production, distribution, and consumption of wealth, **1076–8**, **3989**; bankruptcy, **326–7**; banks, **327–9**, **1230**, **1224**; Boards of Trade, **440–1**; boycott, **476**; Building and Loan Associations, **528**; child labor laws, **728–9**, **1218**; commerce, **852–3**, **1794**; coöperative societies, **879–80**; corporations, **893–4**; credit, **917–8**; employers' liability, **1145**; factories and factory laws, **1218**, **1778** **728–9**; fairs and markets, **1219–20**; Federal Trade Commission (U.S.), **1230**; gilds, **1459–60**; Hanseatic League, **1576**; Industrial Revolution, **1778**, **210**, **1218**, **48**, **3735–6**; insurance, **1791–2**; labor organizations and legislation, **1947**, **1487**, **1218**, **728–9**, **3400**, **172–3**; money, **2281–4**, **2258–9**; national debts, **2399**; percentage and interest, **2724–6**; pensions, **2722**; poor-laws, **2878–9**; population, **2880–1**; public utilities, **2932–3**, **1794**, **3704**; slavery and serfdom, **3248–50**; socialism, **3268–9**, **2156–7**; stamps and stamp taxes, **3337–8**; stocks and bonds, **3358–60**; sweatshop system, **3400**; tariff and taxation, **3437–8**, **3440–2**, **1741**, **3337–8**; transportation, **3524–6**, **2962–72**; trusts, **3545–6**, **1330**.

**Ec'tor, Sir,** a knight of the Round Table, **3069**.

**Ecuador** (*ĕk'wà-dôr*), S. Amer. republic, on Pacific coast; 116,000 sq. mi.; pop. under 2,000,000; cap. Quito; **1078–30**, *maps*, **2744**; **3288–9**; Andes, **122–3**; cacao, **3286**, **1079**; cinchona bark, **3286**; history and govt., **1079–80**; Panama hats, **1597**, **1078**; population, **1079**, *map*, **3288–9**; rainfall, *map*, **3288–9**; surface, **1078–9**, *map*, **3288–9**; vegetable ivory, **549**, **1079**; vegetation, *map*, **3288–9**.

**Ecumen'ical** ("universal") **Councils** of the church, **763–4**.

**Edam** (*ā-dăm'*), Netherlands, town in n. Holland, 12 mi. n.e. of Amsterdam; pop. 7000; makes ships, rope, leather, **2441**.

**Edam cheese, 709**.

**Ed'das,** two collections of early Scandinavian literature, **3134**.

**Eddy, Asa Gilbert** (d. 1883), husband of Mary Baker Eddy, **1080**.

**Eddy, Mary Baker** (1821–1910), founder of Christian Science, **1080**.

**Eddystone lighthouse, 2004**.

**Edelweiss** (*ā'dĕl-vīs*), a small white flower of the aster family, found in Alps, **3419**.

**E'den** (Bible), garden of paradise, home of Adam and Eve; legend locates in Euphrates valley, **2200**, **1187**; 'Paradise Lost', **2244–6**.

**Edenta'ta,** an order of toothless mammals, **2132**; ant-eater, **145–6**; armadillo, **211**; sloth, **3252**.

**Edessa** (*ē-dĕs'à*). Anc. city in Asia Minor; became great center of early Christianity and learning; modern city Urfa or Orfah (pop. 30,000).

**Edfu** (*ĕd'fụ*), Egypt. Anc. town on Nile, 54 mi. s.e. of Thebes; Temple of Horus (3d cent. B.C.), most perfect existing Egypt. temple.

**Edgar** (944–975). King of England; called "the peaceful" because of his quiet reign.

**Edgehill,** England. Ridge 12 mi. s. of Warwick; first battle of Civil War, Oct. 1642, between Parliament forces under the Earl of Essex and Royalists under Charles I.

**Edgeworth, Maria** (1767–1849). Irish-Eng. novelist whose Irish stories ('Castle Rackrent', etc.) influenced Thackeray and Turgenief; her 'Belinda' introduced the natural heroine, who failed to faint and blush constantly.

**Edict of Nantes** (1598), decree granting religious freedom to Fr. Huguenots, **1696**, **1637**, **2389**.

**Edinburgh** (*ĕd'in-bŭr-ō*), cap. and 2d largest city of Scotland, "Athens of the North"; pop. 327,000; **1080**, **1082**; book shops, **3149**; Jenny Geddes, **3148**; 'The Story of Greyfriars Bobby', **1024–5**.

**Edinburgh, University of,** at Edinburgh, Scotland; co-ed.; arts, medicine, law, theology, music; **1080**, **1082**, **832**.

**Ed'inburghshire** or Midlothian. County of s.e. Scotland on Firth of Forth; 366 sq. mi.; pop. 528,000; oats chief crop; cap. Edinburgh.

**Edison, Thomas Alva** (born 1847), Amer. inventor and manufacturer, **1083–4**, *picture*, **1085**; invents incandescent lamp, **1123**; invents phonograph, **2774–5**; storage battery, **3362**.

**Edisto River,** in S. Carolina; 150 mi. long; *map*, **3291**.

**Ed'monton,** Canada, cap. of Alberta; pop. 60,000; important r.r. and trading center; **1084**, **83**, **3129**.

**Edmund** (922–946), Saxon king of England, grandson of Alfred the Great and son of Edward the Elder; warred with the Danes, conquered Cumbria; **1152**.

**Edmund Ironside** (981–1016), Saxon king of England, son of Ethelred "the Unready"; led Saxon armies against Canute, who defeated him and compelled division of England; named "Ironside" for extraordinary strength and courage; **639**.

**Edmunds, George Franklin** (1828–1919). Amer. lawyer and political leader, U.S. senator from Vt. 1866–91; member of Hayes-Tilden Electoral Commission; author of Edmunds Act and of Anti-Trust Law of 1890 (usually called Sherman Act).

**Edmunds Act, 223**.

**Edom** (*ē'dŏm*), rugged country, s. of Palestine, later called Idumaea; Edomites enemies of Israelites, **1889**.

**Ed'red** (d. 955 A.D.). Saxon king of England, subdued Danes in Northumberland; guided chiefly by his intimate friend St. Dunstan; **1152**.

**Educa'tion, 1084**, **3993**; apperception, **158–60**; athletics, **251**; Australia, **267**, **269**, *picture*, **3141**; Babylon, **294**; of blind, **436–7**; Boy Scouts, **478–86**; Camp Fire Girls, **592–4**; in Canada, **622**, **2947**, **2948**, **833**; Charlemagne's interest in, **689**; Chautauquas, **707**; child training,

**729–35**; in China, **639, 2708, 3034,** *pictures*, **3139, 746**; early Christian church, **763**; colleges and universities, **827–33, 3606**; color training, **1216**; of deaf-mutes, **970**; federal aid (in U.S.), **830, 1960, 3655–6, 3141**; Finland, **1248**; France, **3138–9, 3140, 832**; Gary system, **1401–2**; Germany, **3138–9, 3140, 832, 1444**; Girl Scouts, **1464–5**; Gt. Brit., **3138–9, 3140, 2610–1, 832, 1468**; how to study, **3372–4, 2197**; illiteracy statistics, **2881**; India, **1756, 1743**; intelligence tests, **1792–3**; Italy, **1839, 450**; Japan, **1871–2, 1868, 3511**; kindergarten, **1372, 1923–5, 3141**; memory training, **2197**; Montessori method, **2313**; motion pictures, **2341–2, 2344**; nature study, **2406–17**; negroes (U.S.), **2434–5, 3674, 73**; Philippines, **2767–8**; play and games, **2832–8**; psychology an aid, **2931, 2197, 158–60, 1792–3**; schools, **3138–42**; school gardens, **3142–3**; social settlements, **3269, 16–18**; S. Amer., **193, 495, 738, 836, 3622**; Spain, **3302, 2111, 832**; anc. Sparta, **3308–9**; Sweden, **3404, 3358, 3402,** *picture*, **3141**; technical and vocational, **3140–1, 3653–6, 47, 997–8, 1150, 1675**; Turkey, **3561**. *See also in Index* **Arithmetic** and other school subjects by name; **Illiteracy; United States:** *Education*.

**Education, Bureau of,** U.S., **3601**; work in Alaska, **77–8**.

**Edward I** (1239–1307), king of England, **1087–8, 1153, 1634**; on 7th Crusade, **932**; victory at Evesham, **2317**; Model Parliament, **2687**; attempts to conquer Scotland, **3148**; subdues Wales, **3664**.

**Edward II** (1284–1327), England, **1088, 2054**; defeated at Bannockburn, **518, 3148**.

**Edward III** (1312–77), England, **1088, 3751, 2054**; claims Fr. throne, **2763, 1699, 1700**; establishes Order of the Garter, **979**; in Hundred Years' War, **1699, 570**; wars in Scotland, **3667, 2**.

**Edward IV** (1442–83), England, first of the Yorkist kings, **1088, 3068**.

**Edward V** (1470–83), England, the boy king, **1088, 3016–7, 2050**.

**Edward VI** (1537–53), England, **1088–9**.

**Edward VII** (1841–1910), England, **1089**; marriage, **757**; Victoria's attitude toward, **3640**.

**Edward the Black Prince** (1330–76) (so called because of his black armor), prince of Wales, son of Edward III of England, and father of Richard II; victor of Poitiers (1356) and sharer in victory of Crécy (1346); great soldier and national hero; **1699, 1700, 466**.

**Edward the Confessor** (1004–66), last of Saxon kings of England, **1087, 1152**; begins Westminster Abbey, **3719**; and William I, **3739**.

**Edward the Elder** (d. 924 A.D.), Saxon king of England, **1087**.

**Edward the Martyr** (963?–979), Saxon king of England, **1087**.

**Edwards, Jonathan** (1703–58), New England theologian, b. South Windsor, Conn.; America's leading representative of strict Calvinism; 'Freedom of the Will' called "the most famous book on theology that America has produced and one of the most famous philosophical books of the world"; **111**.

**Edwardsville,** Ill. City 70 mi. s.w. of Springfield; coal-mining and agricultural center; pop. 5336; site of Kickapoo Indian agency, instrumental in transferring great tract of land from Indians to U.S.

**Ed'wy** or **Eadwig** (939–959), Saxon king, eldest son of Edmund I; succeeded his uncle 955; shared throne with brother Edgar; **1152**.

**Eel** (*ēl*), elongated, snakelike fish, **1089**; eggs laid by conger, **127**; electric, **3517, 1276, 1089–90,** *picture*, **1273**; migrations, **2234, 130**.

**Eelworm, 3814.**

**Ef'ferent nerves, 2437.**

**Eg'bert** or **Ecgbert** (775?–839), king of Wessex; conquered Northumbria and Mercia; called "first king of the English"; **1152**.

**Eger** (*ā'gĕr*). City in Bohemia, on Eger R., 92 mi. w. of Prague; pop. 27,000; Wallenstein assassinated 1634; machinery, textiles.

**Eger,** river in Czecho-Slovakia, 160 mi. long, **1107**.

**Egeria** (*ē-jē'rĭ-à*), in Rom. myth., a nymph who inspired Numa Pompilius, **3041**.

**Egg, 1090–1**; albumen in, **83**; alligator, **98**; beetle, **368**; birds, **401, 406–8**; butterflies and moths, *pictures*, **547**; coloration of bird eggs, **407**; crocodile, **923**; development into animal, **1140–1, 1641–2**; economic value of poultry eggs, **2908**; fish, **1275, 1280**; fly, **1312, 1313**; food value, **1320, 1321, 2238, 2926, 3651, 3652**; frog, **1373,** *pictures*, **3651, 3652**; frog, **1373,** *pictures*, **1374**; grasshopper, **1506**; hatcheries for fish eggs, **1280,** *picture*, **1281**; honey bee, *picture*, **1787**; how to cook, **877**; incubating hen eggs, **2909–10,** *picture*, **2911**; lacewing fly, **1789**; laid by mammalian duckbill and echidna, **1046**; lizard, **2038**; lobster, **2042**; locust, **1506**; mosquito, **2338,** *picture*, **2335**; ostrich, **2603**; perch, **2726**; phosphorus in, **2777**; poultry, **2908–11**; protected by some male fish, **1275, 3165, 3357**; shark, **3197**; shells contain lime, **2010**; skate or ray, **3244**; snake, **3261,** *picture*, **3258**; sulphur in, **3389, 3242**; toads, **3507**; turtle, **3562**. *See also* articles on various birds.

**Egg-eater,** a S. African snake, **3259**.

**Eggleston** (*ĕg'l-stŏn*), **Edward** (1837–1902), Amer. novelist, historian, and Meth. Episc. minister; b. Vevay, Ind.; one of the pioneers in picturing local Amer. life and customs ('The Hoosier Schoolmaster'; 'Household History of the United States'; 'Tecumseh', one of a series of juvenile biographies of Amer. Indians); **1762**.

**Eggplant,** plant of nightshade family with purplish edible fruit, **2901**; when and how to plant, **1397**.

**Eginhard.** Same as **Einhard**.

**Eg'lantine,** or sweetbrier rose, **3066**.

**Eg'mont, Lamoral, Count of** (1522–68), Flemish hero, gov. of Flanders and Artois under Philip II of Spain; his unjust execution for treason by Council of Blood gave impetus to the Netherlands' revolt; theme of Goethe's 'Egmont'; **520**.

**Egoists** (*ĕg'ō-ĭsts*), or epicureans, in philosophy, **2772**.

**Egret** (*ē'grĕt*), great white heron, **3365**.

**Egypt** (*ē'jĭpt*), **ancient, 1098–1107,** *map*, **1100**; agriculture, **48, 3732**; alphabet, **100, 101**; astronomy, **239**; boats and ships, **3207, 3524,** *picture*, **3525**; books and literature, **455, 1100, 1102**; bread, **496**; brick-making, **503**; canals and irrigation works, **625, 1092, 1828,** *picture*, **1093**; enameling, **1145**; fisheries, **1282**; furniture, **1383, 1100**; harps, **1589,** *picture*, **1590**; horses used, **1684, 1685, 3524**; industry and trade, **1100**; ink, **1780**; language and writing, **1098–9, 3816, 3817, 1649, 2666,** *picture*, **2710**; mathematics, **93, 1422**; mining, **2251, 1479**; painting, **2627, 1100,** *pictures*, **1102, 2629**; papyrus, **2674, 2666**; sculpture, **3155, 1100, 3316–7,** *pictures*, **1103, 1104, 1105, 1106, 1206, 3155**; slavery, **3248**; spinning and weaving, **3326, 904**; toys, *pictures*, **3522, 1026**; water-clock, **797**.

*Architecture*, **176,** *picture*, **178**; pyramids, **2939–40, 1099–1100, 568–9,** *pictures*, **1094, 570, 2939, 2940**; temple at Philae, *picture*, **1106**; temples of Luxor and Karnak, **1104, 569–70,** *pictures*, facing **176, 1101, 1104, 1105**.

*Religion and mythology*, **1105–6, 1099, 1100, 3155**; animal worship, **1106, 369, 1410, 658, 923, 2286, 3364**; Isis, **1832**; mummies, **2369,** *picture*, **1104**; Osiris, **2602**; priests, **1104, 2193**.

*History:* chief events summarized, **1655–7**; beginnings of civilization, **1098–9**; influence on Mediterranean civilizations, **27–28, 2774**; Pyramid Age, **1099–1100, 1102**; Feudal Age (2500–1800 B.C.), **1102**; Theban dynasties, **1104–6**; conflicts with kingdom of Judah, **1890**; ruled by foreigners, **1106–7**; Persian conquest, **2737**; Alexander the Great conquers (332 B.C.), **86**; under Ptolemies, **2931, 1107, 88, 1992, 1891**; Cleopatra, **789**; made Rom. province (30 B.C.), **2931, 258**; rise of monasticism, **2298–9**.

**Egypt, modern,** an independent country of n.e. Africa; 350,000 sq. mi.; pop. 13,000,000; cap. Cairo; **1092–1107,** *maps*, **40–1, 1095**; agriculture, **1093, 1096–7, 904, 966,** *pictures*, **46**; chief cities, **87–8, 566–70**; climate, **1092, 1093**; the Fayum, **1093, 1097**; foreign trade, **88, 567**; irrigation, **1828, 1092, 1096,** *pictures*, **1827, 1096, 1093**; manufactures, **1097, 88, 567**; Nile, **1092, 2510**; population, **1096, 1094, 1092–3, 37, 567,** *map*, **40–1**; **rainfall,** *map*, **40–1**; religion, **1094**; Sahara desert, **3104–6**; Sudan, **1093, 3384**; Suez Canal, **3384**; surface, **1092, 1093–4, 1096,** *map*, **40–1**; vegetation, *map*, **40–1**.

*History:* Mohammedan rule, **1107, 2278, 566, 3112**; Napoleon's campaign, **2393, 1107**; Suez Canal built, **3384**; British occupation, **513, 1489, 1929**; in World War, **3795, 513**.

**Egyptian cotton, 904, 202, 1830, 2444.**

**Egyptianized clay, 784.**

**Egyptian rice corn, 3276.**

**Ehrenbreitstein** (*ā-rĕn-brīt'shtīn*), Germany, town across the Rhine from Coblenz; fortress on rock 400 ft. high; taken by French 1799; restored to Germany by Congress of Vienna 1815; occupied by Amer. Army of Occupation 1918; **3005**.

**Ehrlich** (*ār'lĭĸ*), **Paul** (1854–1915). Ger. bacteriologist; discovered drug salvarsan; Nobel prize winner 1908.

**Eichendorff** (*ī'ĸĕn-dôrf*), **Joseph, Baron von** (1788–1857). Ger. poet and story-writer; his poems are probably the finest lyric expression of Ger. romanticism; best remembered for prose tale 'Aus dem Leben eines Taugenichts' ("From the Life of a Good-for-Nothing").

**Eiderdown,** obtained from eider duck, **1046**; Iceland exports, **1724**; used by Eskimos, **1175**.

**Eider duck, 1046.**

**Eifel** (*ī'fĕl*), **The.** Barren plateau of Germany in Rhine Province, s.w. Prussia; about 1000 sq. mi.; average elevation 1500 to 2000 ft.; of volcanic origin.

**Eiffel** (*ā-fĕl'*), **Alexandre Gustave** (born 1832). Fr. engineer, builder of Eiffel Tower, and authority on aerodynamics.

**Eiffel Tower,** Paris, **2684, 3767,** *picture*, **1345**.

**Eiger** (*ī'gĕr*), peak (13,042 ft.) in Bernese Oberland of the Swiss Alps, **3413,** *picture*, **102**.

**'Eikon Basilike'** (*ī'kŏn bà-sĭl'ĭ-kē*). Famous book which appeared immediately following execution of

Charles I and professed to be the king's own account of his sufferings in prison; probably written by Bishop John Gauden (1605–62).

**'Eikonoklastes'** ("image breaker"). Milton's defense of the execution of Charles I, written to counteract 'Eikon Basilike'; at the Restoration it was ordered suppressed and burned by the hangman.

**Einhard** (*īn'härt*) or **Eginhard** (*ā'gĭn-härt*) (770?–840?). Secretary and biographer of Charlemagne; married Emma, Charlemagne's daughter; his biography of Charlemagne the greatest handed down from Middle Ages.

**Einsiedeln** (*īn'zē-dĕln*), Switzerland. Town 20 mi. s.e. of Zürich; famous pilgrim resort; Benedictine abbey (10th cent.) containing miracle-working image of the Virgin; reputed birthplace of Paracelsus.

**Einstein** (*īn'shtīn*), **Albert** (born 1879), Ger.-Swiss scientist of Jewish parentage, b. Germany; attended school and taught for many years at Zürich, Switzerland; author of theory of "relativity," declared by advocates to be greatest scientific principle propounded since Newton's theory of gravitation; theory of influence of gravity upon light, **2001**, *picture*, **1999**. *See also in Index* **Relativity.**

**Eisenach** (*ī'zē-näcĸ*), summer resort in cent. Germany at n.w. end of Thuringian Forest; pop. 40,000; near by is famous castle of Wartburg, where contests of Minnesingers were once held; birthplace of Bach, **300**; refuge of Luther, **2085.**

**Eisleben** (*īs'lā-ben*), Germany, town in Saxony, 20 mi. n.w. of Halle; pop. 25,000; copper and silver smelter; Luther, **2084, 2085.**

**Eisner, Kurt** (1867–1919). Bavarian (Jewish) socialist politician; arranged mass meeting which led to overthrow of Bavarian monarchy and became pres. of revolutionary govt.; revelations as to origin of war made him obnoxious to reactionaries and he was assassinated.

**Ekaterinburg** (*ā-kä-tā-rēn-bŭrĸ'*), Russia, mining center (platinum and gold), on Iset R., at e. foot of **Ural Mts.**; pop. 52,000; contested between Bolshevist and anti-Bolshevist forces 1918–19; place of imprisonment for Nicholas II and family, **2506.**

**Ekaterinodar** (*ā-kä-tā-rē-nō-där'*) or **Yekaterinodar,** Russia. Fortified city of n. Caucasia on Kuban R. 90 mi. e. of Black Sea; pop. 108,000; farming, cattle-raising, and fishing interests.

**Ekaterinoslaf** (*ā-kä-tā-rē-nō-släf'*) or **Yekaterinoslav.** Mfg. and trade city in the Ukraine, on Dnieper, 250 mi. n.e. of Odessa; pop. 220,000; iron products, flour; timber depot.

**Ek'ron,** most northerly of the five Philistine cities, **2770.**

**Elagabalus** (*ĕl-ā-găb'ā-lŭs*). Same as **Heliogabalus.**

**Elaine** (*ĕ-lān'*), in Arthurian legend the fair maid of Astolat who pines and dies for love of Sir Lancelot, **3068, 3069, 3070.**

**Elam** (*ē'lăm*). Bible name for anc. Persian province of Susiana or for its n.w. part.

**E'land,** S. African antelope, **146.**

**Elasmobranchii** (*ē-lăs-mō-brăn'kĭ-ī*), sub-class of cartilaginous fishes, **1271–2, 3948;** includes sharks, **3196–7,** skates and rays, **3244;** rank among animals, *diagram*, **128.**

**"Elastic clause,"** in U.S. Constitution, **862.**

**Elastic'ity,** of gases, **1403;** of rubber, **3071;** of the skin, **3246.**

**Elba** (*ĕl'bä*), Ital. isl. off w. coast; 140 sq. mi.; pop. 25,000; *map*, **1836;** iron mines, **1838;** annexed by Napoleon I, **2394;** Napoleon exiled to, **2396.**

**Elberfeld-Barmen** (*ĕl'bĕr-fĕlt-bär'-mĕn*), two towns in w. Germany forming single industrial community; combined pop. 314,000; textiles; **1443.**

**Elbe** (*ĕl'bĕ*) **River,** Germany's 2d river in importance; flows 725 mi. to North Sea; internationalized to Prague by Versailles Treaty to give Czecho-Slovakia access to sea; **1107;** at Dresden, **1041;** at Hamburg, **1567, 1579,** *pictures*, **1567, 1441.**

**El'bert, Mt.,** peak in Lake County, cent. Colo. (14,402 ft.); **842.**

**Elbow River,** in s.w. Alberta, Canada, **575.**

**Elbruz** (*ĕl-brųz'*). **Mt.,** peak of Caucasus Mts. in Transcaucasia, highest point in Europe (18,470 ft.); **663, 1345;** view from, *picture*, **3091.**

**Elburz** (*ĕl-bųrz'*) **Mts.,** range of Persia along s. border of Caspian Sea; highest point Mt. Demavend (18,600 ft.); **2734–5.**

**El Caney** (*ĕl kä-nā'*), Cuba, town 4 mi. n.e. of Santiago; Spanish defeated by Americans under Lawton (July 1898); **3306.**

**El Capitan** (*kä-pē-tän'*), granite rock in Yosemite Valley, Calif. (3600 ft.), *picture*, **3831.**

**Elchingen** (*ĕl'ĸĭng-ĕn*). Village in Bavaria on Danube, 75 mi. n.w. of Munich; victory of French under Ney over Austrians (1805).

**Elder,** flowering shrub, **1107.**

**Elderberry, 1107, 1379.**

**El Dorado** (*ĕl dō-rä'dō*), mythical region abounding in gold and precious stones, believed by Span. explorers to be somewhere in America, **999;** Raleigh seeks in Guiana, **1547, 2975.**

**Eldorado,** Kan., trade center for great oil field and rich agricultural region, 27 mi. n.e. of Wichita; pop. 10,995; refineries, machine shops, wagon works, limestone quarries; **1911.**

**El'eanor** (1122?–1204), duchess of Aquitaine, queen of Louis VII of France, and later, after being divorced by him, of Henry II of England; **2064, 1633, 1634, 3015.**

**Elections, 1107–8;** ballot, **320–1;** Canada, **620–2;** Congress, **860;** direct primary, **2915;** Parliament (England), **2688, 2689;** presidential, **2913–4;** recall, **1779;** suffrage, **3384–5, 3777–9;** voting machine, **321.**

**Elector, the Great.** *See in Index* **Frederick William.**

**Electoral College, U.S., 2913–4, 3594.**

**Electors,** of the Holy Roman Empire, **1675, 1447–8.**

**Electors, presidential,** or electoral college (U.S.), **2913–4, 3594.**

**Elec'tra.** In Gk. myth., daughter of Agamemnon and Clytemnestra; saved life of her brother Orestes to be their father's avenger and aided him in slaying Clytemnestra; subject of dramas by Sophocles, Aeschylus, Euripides, and many modern authors.

**Electra,** Tex. Oil-producing town 90 mi. n.w. of Dallas and 28 mi. n.w. of Wichita Falls; pop. 4744.

**Electrical conductors.** *See in Index* **Conductivity.**

**Electrical engineering, 1149.**

**Electric appliances** for the home, **1114–6;** alloy used in heating filament, **99.**

**Electric arc.** *See in Index* **Arc, electric.**

**Electric automobile, 276, 3361.**

**Electric battery,** a number of cells connected into a unit, **1120, 1108;** storage batteries, **3361–2.**

**Electric car,** of railway, **3371–2.**

**Electric clocks, 803.**

**Electric drive,** on battleships, **2428.**

**Electric eel, 3517, 1276, 1089–90,** *picture*, **1273.**

**Electric elevator, 1132–3, 1134.**

**Electric fishes, 1276, 3517, 1089–90,** *picture*, **1273, 3517.**

**Electric furnace, 1382–3;** artificial gems, **1410;** calcium carbide, **8;** carborundum, **3234;** phosphorus, **2777;** steels, **1826.**

**Electric heating, 1619, 1116.**

**Electricity 1108–22,** *Study Outline*, **4035–38;** ammeters, **1113, 1114, 1392;** audion, **257;** cables, submarine, **556–61;** carried by radium rays, **2960;** conductors, **1110, 3242, 881, 3757–8;** direct and alternating current, **1114, 1052, 1125, 3371;** electromagnetic induction, **1050, 1121, 1224,** *pictures*, **1051;** electromagnets, **1113, 2121–3, 1121, 1224;** electron theory, **1112, 256–7;** electrostatic machines, **1112, 1117;** Franklin theory, **1112;** fuses, **1114;** galvanometers, **1113, 1392;** in gas engine, **1404, 279, 280, 282;** generated by cells, **1113, 1120, 1112,** *picture*, **1109;** generated by dynamos, **1050–2;** history ("The Men Who Discovered Electricity's Secrets"), **1117–22;** hydroelectric generation, **3694–5, 2502, 3697;** induction coils and transformers, **3523–4;** insulators, **1110, 816, 1554, 2219, 3071, 3758;** lighting, **1122–5;** lightning, **2006–7, 1118;** long-distance transmission, **3523–4, 3371, 1125;** measurement of current, **1113, 1114, 1116;** motors, **1124–5;** Niagara output, **2502,** *picture*, **3695;** origin of name, **106;** oscillating current, **1114;** positive and negative, **1110, 1112;** radio, **3758–67;** "static" and "current," **1108, 1110;** storage batteries, **3361–2;** street railways, **3370–2;** telegraph, **3454–8;** telephone, **3458–61;** thermocouples, **1113;** transmitting properties of crystals, **935;** vacuum cleaner, **3614;** volts and voltage, **1116, 1110;** X-rays, **3824–6.**

**Electric-light bug, 3698.**

**Electric lighting, 1123–4;** carbon filament lamps, **1123, 642;** construction of bulb, **3614;** Edison's inventions, **1084;** power station, **1124,** *pictures*, **1124, 1797, 3695;** tungsten filament lamps, **1124, 3548;** voltage used, **3523.**

**Electric locomotive, 2968, 1125.**

**Electric meter, 2204–5.**

**Electric motor, 1124–5;** battleship propulsion, **2428;** street railways, **3370–2.**

**Electric oscillation, 1114.**

**Electric power, 1113;** advantages of alternating current, **1052, 3371;** applied to lighting, **1123–4;** experiments with tidal engines, **3498;** generated by dynamos, **1050–2;** generated by water-power, **3695, 3554;** hydroelectric resources of U.S., **3694,** *picture*, **3697;** long-distance transmission, **3371, 1125, 3523–4;** Niagara output, **2502,** *pictures*, **2482, 3695;** obtained from volcanoes, **3660;** transformers, **3523–4, 3371.**

**Electric railways, 3370–2, 2967–8, 1125.**

**Electric ray,** or torpedo fish, **3517.**

**Electric shock,** first aid for, **1270.**

**Electric welding, 3716.**

**Electrifica'tion of railways, 2967–8, 1125.**

**Electrocu'tion, 2919.**

**Elec'trode,** point at which electric current enters or leaves a solution or electrical device, **1125;** in Crookes tube, **3824.**

**Electrodynam'ics** or **electrokinetics,** science of electricity in motion, **1110, 1125.**

**Electrol'ysis,** electrical decomposition of a compound in solution, **1125, 3371;** in electroplating, **1125;**

measures electric current, **1114**; in metallurgy, **1125, 105, 883, 1480**; in scientific discovery, **1121, 969, 1224**; in soda-making, **3272**.
**Elec'trolyte,** a liquid decomposed by electrolysis, **1125**.
**Electrolyt'ic furnace, 1383.**
**Electromag'net, 1113, 2121–2, 1121**; in dynamos, **1050–2**; in motors, **1124, 1125**; in telegraphy, **3456**; in telephone, **3458**.
**Elec'tromotive force** or **potential, 1116, 1110.**
**Elec'trons,** 256–7, **1112,** *pictures,* **1109, 1111**; in audion, **257,** *picture,* **3761**; in Crookes and X-ray tubes, **3824–5**; development of theory, **1122, 2787, 3824**; radio-activity, **2959**; size, **1125**.
**Electron valve.** *See in Index* **Audion.**
**Elec'troplating,** coating with metal by electrolysis, **1125**; galvanizing, **1120**.
**Elec'troscope,** device for detecting electric charges, **1110,** *pictures,* **1110, 1112.**
**Electrostat'ics,** science of electric charges at rest, **1110, 1118.**
**Elec'trotyping,** method of duplicating type or engravings by electroplating, **1125**; books, **458**; magazines, **2475**; phonograph records, **2775–6.**
**Elec'trum, 3242.**
**Elegiac** (*ĕ-lē'ĝī-ăk*) **meter, 1536.**
**Elegy** (*ĕl'ē-ĝi*), defined, **2851.**
**'Elegy in a Country Churchyard',** by Thomas Gray, **1166.**
**Element,** in chemistry, **710–1, 256**; determining atomic weights, **4038**; possible "transmutation" of radio-active elements, **2959**; tables of atomic weights, symbols, and valences, **4042, 715.** *See also in Index* **Aluminum, Antimony,** and the other elements by name.
**Elephant, 1126–32**; albinos in Siam, **3226, 1127**; altitude range, **397**; duration of life, **126**; evolutionary position, *diagram,* **128**; fossil types, **138**; in India, **1748**; ivory, **1853–4**; mammoth and mastodon related, **2132,** *picture,* **667**; "plantigrade" foot, **1682,** *picture,* **1323**; seal related, **1336**; skeleton, *picture,* **3245**; story, 'Mogul, the Baby Elephant', **1128–32**; tusks and modified teeth, **3454**; used in anc. warfare, **2941, 1575,** *picture,* **1577.**
**Elephant,** size of paper, **2673.**
**Elephan'ta Isle,** small isl. between Bombay and mainland of India; interesting for Hindu religious sculpture; named from colossal statue of elephant found there; underground temples, **1755.**
**Elephant beetle, 368,** *picture,* **367.**
**Elephant Butte Dam, 3022, 2465, 1829, 1139,** *picture,* **2464.**
**Elephant garlic,** a large artificially bred type, *picture,* **539.**
**Elephantiasis** (*ĕl-ĕ-făn-tī'ă-sĭs*), or "elephant skin," disease in which parts of body swell enormously and skin becomes discolored and hardened; caused by a worm, **3814.**
**Elephantine** (*ĕl-ĕ-făn-tī'nē*), Egypt. Small isl. in the Nile opposite Assuan (Syene); anc. monuments and nilometer (water-gauge).
**Elephant Mound, 2357.**
**Elephant seal, 3168–9.**
**El Erg,** an oasis of Sahara, **3104.**
**Eleusin'ian mysteries,** religious rites of anc. Greece, **993.**
**Eleusis** (*ĕ-lū'sĭs*), anc. city in Attica, Greece, on coast opposite isl. of Salamis; in early times a powerful rival of Athens; Eleusinian mysteries in honor of goddess Demeter (Ceres), **993.**
**Eleutheropolis** (*ĕ-lū-thēr-ŏp'ō-lĭs*). Anc. city of Palestine, 25 mi. s.w. of Jerusalem; Biblical Mareshah; rebuilt during Crusades; modern Beit Jibrin; famous caves in nearby hills and many ruins of biblical and Roman times.
**Elevated railways, 3370–2.**
**Elevator,** in buildings, **1132–4.**
**Elevators, grain, 1492, 527, 3731–2,** *picture,* **604.**
**Elf** (pl. elves), a mischievous sprite, **1219.**
**El Ferrol.** *See in Index* **Ferrol.**
**Elf owl, 2607.**
**Elgar** (*ĕl'gär*), **Sir Edward** (born 1857). Perhaps the greatest of recent Eng. composers; oratorio 'The Dream of Gerontius' received as a new revelation in Eng. music; first symphony (1908) created furor; 'Sea Pictures', a song cycle; 'Pomp and Circumstance', a popular march; 'Falstaff', a symphonic study.
**Elgin** (*ĕl'gĭn*), **James Bruce,** 8th **Earl of** (1811–63). Eldest son of 7th earl; appointed gov. of Jamaica at 30; gov.-gen. of Canada 1846–54, one of the most popular holders of this office; viceroy of India (first appointed directly by the Crown) 1860 to his death.
**Elgin, Thomas Bruce,** 7th **Earl of** (1766–1841). Eng. diplomat and art collector, envoy to Belgium, Prussia, Turkey; removed "Elgin marbles" from Athens and sold them to nation.
**Elgin** (*ĕl'gĭn*), Ill., 36 mi. n.w. of Chicago, on Fox. R., important market for butter and other dairy products; pop. 27,454; makes watches, watch-cases, shoes; large publishing house; **1736.**
**Elgin marbles,** remains of Parthenon sculptures in Brit. Museum, **1530, 2056.**
**E'li.** Hebrew priest and judge, under whose care Samuel was brought up (I Samuel).
**Elia** (*ē'lī-ȧ*), pen name of Charles Lamb ('Essays of Elia'), **1958, 1178, 1167.**
**Eli'jah,** Hebrew prophet; denounced Ahab, king of Israel, for idolatry, destroyed the 450 prophets of Baal; was carried to heaven in chariot of fire (I Kings xvii; II Kings ii); **2922.**
**El'iot, Charles William** (born 1834). Amer. educator, b. Boston, pres. of Harvard (1869–1909), introduced elective system into Amer. colleges; frequent writer and speaker on public questions; advocate of prohibition, coöperation between labor and capital, international peace through League of Nations.
**Eliot, George** (1819–80), pen name of Mary Ann Evans, Eng. novelist, **1134–6, 2540, 1167**; 'Story of Silas Marner', **1135–6.**
**Eliot, John** (1604–90), "apostle to the Indians," New England missionary, b. England; joint author of the 'Bay Psalm Book', and translator of Bible into Algonquian Indian tongue; **2165.**
**Eliot, Sir John** (1592–1632). Eng. statesman, Parliamentary leader with Pym and Hampden against Charles I's encroachments; promulgated theory of a responsible ministry; imprisoned for 2 years and died in Tower of London, a martyr to Eng. liberty.
**E'lis,** dist. of anc. Greece in w. Peloponnesus (with Achaia forms nome or dept. of modern Greece); *map,* **1518**; Olympic games, **2580.**
**Elis.** Important city of anc. Greece; here all candidates for Olympic games trained for a month; on Peneus R.
**Eli'sha,** Hebrew prophet, on whom fell the "mantle of Elijah," his master and predecessor in struggle against Baal worship (I Kings xix; II Kings xiii), **2922.**
**Elis'sa.** Phoenician name of Dido. *See in Index* **Dido.**
**Elizabeth** (1837–98). Austrian empress, wife of Francis Joseph, assassinated at Geneva by an anarchist.
**Elizabeth** (born 1876), queen of Albert I of Belgium, former princess of Bavaria, **81.**
**Elizabeth Stuart** (1596–1662). Queen of Frederick, "winter king" of Bohemia, and daughter of James I of England, ancestress through her daughter, the electress Sophia, of the Hanoverian (Windsor) kings of England.
**Elizabeth** (1533–1603), queen of England, **1136–8, 447,** *pictures,* **1035, 3188**; Drake, **1030, 1031**; E. India Co. chartered, **1072**; Mary Queen of Scots, **2158**; Raleigh, **2974, 2975,** *picture,* **1137**; religious policy, **1137, 1941**; Spanish Armada defeated, **210–1, 1137, 2763.**
**Elizabeth of York** (d. 1503), queen of Henry VII of England, **1635.**
**Elizabeth,** queen of Charles I of Rumania. *See in Index* **Carmen Sylva.**
**Elizabeth** (1709–62), empress of Russia; daughter of Peter the Great and Catherine I; seized throne 1741; sided against Prussia in Seven Years' War; only her timely death saved Frederick the Great in his last extremity; **3180.**
**Elizabeth Marie Hélène** (1764–94). Commonly called "Madame Elizabeth," devoted sister of Louis XVI of France, executed by revolutionary tribunal.
**Elizabeth, Saint** (1207–1231). Hungarian princess, wife of the landgraf of Thuringia; legend says, when her stern husband seized a basket she was carrying to the poor, the bread in it was miraculously transformed into roses.
**Elizabeth,** N.J. City and port on Newark Bay and the Arthur Kill, 14 mi. s.w. of New York City; pop. 95,783; extensive shipping by land and water; oil refining, mfrs. of sewing machines, ships, automobiles, steel products; much historic interest.
**Elizabethan Age,** in Eng. literature, **1164, 3188**; Bacon, **300–1**; romances, **2539**; Shakespeare, **3188–91.**
**Elizabethan architecture, 188.**
**Elizabeth Bennet.** Sensible, charming heroine of Jane Austen's 'Pride and Prejudice'; Elizabeth is "Prejudice" and Philip Darcy, whom she finally marries, is "Pride."
**Elizabethville,** Congo State. **860.**
**Elk,** or moose, **2325, 979, 980**; name applied to wapiti, **3669.**
**Elkhart,** Ind. Mfg. and r.r. city in n.-center on St. Joseph and Elkhart rivers; pop. 24,277; has largest band-instrument factory in world.
**Elk Mts.** Range in w. Colo., just w. of Sawatch Range; highest point, Castle Peak, 14,259 ft.
**Ellendale,** N.D., city in s., 37 mi. n. of Aberdeen, S.D.; pop. 1334; State Normal School; **2525.**
**Ellesmere** (*ĕlz'mēr*) **Island** or **Land,** n.w. of Greenland, from which it is separated by Smith Sound and Kennedy Channel; uninhabited barren waste almost covered by glacial ice caps; *map,* **2514–5.**
**Ellice** (*ĕl'ĭs*) or **Lagoon Islands,** group of small coral isls. belonging to Gt. Brit., in Pacific, n. of Fiji Isls.; 14 sq. mi.; pop. 3000; **2621, 2624.**
**Elliotson, John** (1791–1868). Eng. physician, one of the first to urge clinical lectures as method of teaching medicine; physician to both Dickens and Thackeray; 'Pendennis' dedicated to him.

**Elliott, John** (born 1858), Amer. painter; chiefly portraits and mural decorations; 'The Goddess of the Tides', *picture*, **221.**

**Elliott, Maxine** (born 1873). Amer. actress, played with E. S. Willard and Rose Coghlan; later star in 'Two Gentlemen of Verona', 'Midsummer Night's Dream', 'Twelfth Night'; after 1908 owned and managed her own theater in New York. Her sister, Gertrude, also a star actress, married Sir Johnston Forbes-Robertson.

**Ellis Island,** small isl. in New York Bay, used as U.S. immigrant station, **2488,** *picture*, **2491.**

**Ellora** (*ĕ-lō'rȧ*), India, town in Hyderabad; famous temples, **1707.**

**Ellsworth, Ephraim Elmer** (1837–61). Amer. soldier, colonel of "Ellsworth's Zouaves," shot at Alexandria, Va.; regarded in his day as the first martyr to cause of Union.

**Ellsworth, Oliver** (1745–1807). Amer. statesman and jurist; proposed "Connecticut Compromise" in Constitutional Convention of 1787; U.S. senator from Conn. 1789–96; drafted bill organizing Federal courts; chief justice of U.S. 1796–99.

**Elm,** a shade tree, **1138–9;** autumn coloration, **3537;** classified, **3533;** flowers, **3534;** leaf, **3536,** *picture*, **1139;** seed, **3172;** trunk and branches, **3539;** Washington, **588,** *picture*, **1138.**

**El'man, Mischa** (born 1892), Rus. violinist and composer ('Humoresque'), **1892.**

**Elmi'ra,** N.Y., mfg. and farming center about 8 mi. n. of Pa. boundary; pop. 45,393; has r.r. repair shops; makes auto parts, bridges, foundry products, knit goods; Elmira College; **2485.**

**Elmira College.** At Elmira, N.Y.; women; chartered 1855, under auspices of Presb. church but now non-sectarian; arts and science, music.

**El Mor'ro** or **Inscription Rock,** in N.M., **2467.**

**Elmo's fire, Saint, 2007.**

**El Paso** (*ĕl pä'sō*), Tex., main distributing point for s.w. U.S., and main gateway between U.S. and Mexico; pop. 77,560; **1139, 3477, 3478.**

**El Rito** (*ĕl rē'tō*), N.M., village in n.; pop. 837; normal school, **2467.**

**El'sa,** in Ger. legend, wife of Lohengrin, **2047.**

**Elsinore** (*ĕl-sĭ-nōr'*) (Danish Helsingör), Denmark, seaport on n.e. coast of isl. Zealand; pop. 14,000; shipbuilding, commerce; scene of Shakespeare's 'Hamlet'; **880.**

**El'ster** or **White Elster,** r. of cent. Germany emptying into Saale 3 mi. s. of Halle; 115 mi.; **1985.**

**Elt'ville** or **Elfeld,** Germany. Small town in Prussia, 5 mi. s.w. of Wiesbaden; printing press set up by Gutenberg in 1465.

**Elwood,** Ind., mfg. city 40 mi. n.e. of Indianapolis; pop. 10,790; trade in live stock, grain, and produce; tin plate, kitchen cabinets, glass, iron products, boxes, canned tomatoes **1760.**

**E'ly, Richard Theodore** (born 1854). Amer. political economist, b. Ripley, N.Y.; for many years head dept. of political economy, U. of Wisconsin ('French and German Socialism in Modern Times'; 'Outlines of Economics' 'Studies in the Evolution of Industrial Society').

**Ely,** England, city on Isle of Ely (a marshy plain) 15 mi. n.e. of Cambridge; pop. 8000; cathedral, **1160.**

**Ely,** Nevada, city in e. of state; pop. 2090; **2445.**

**Elyot, Sir Thomas** (1490?–1546). Eng. diplomat and scholar; friend of Sir Thomas More, remembered for his books 'The Castle of Health', intended as a popular treatise on medicine, and 'Book Named the Governor', a treatise on moral philosophy to guide men destined for high places.

**Elyr'ia,** Ohio. Mfg. city 24 mi. w. of Cleveland and 7 mi. s. of L. Erie; pop. 20,474; automobiles, telephones, phonographs, flour, iron products, rubber goods; ships Berea sandstone.

**Elysium** (*ĕ-lĭz'ĭ-ŭm*) or **Elysian Fields,** in Gk. myth., **1558.**

**El'ytra,** beetle wing-covers, **371.**

**El Yunque** (*ĕl yo͝on'kā*), highest peak in Porto Rico, **2885.**

**Elzevir** (*ĕl'zē-vēr*). Family of Dutch 17th cent. printers famous for beautiful types and choice grade of paper; Louis (1540–1617) began printing in 1583, his five sons carried on the work.

**Emancipa'tion Act, Catholic** (Gt. Brit.), **2559, 2706.**

**Emancipation Act** (Russia), **3091.**

**Emancipation Proclamation,** abolishing slavery in U.S. (Sept. 22, 1862), **1139–40, 778, 2014,** *picture*, **2015.**

**Eman'uel I, the Happy** (1469–1521). King of Portugal, in whose reign, called "Portugal's golden age," Vasco da Gama opened sea route to India, Cabral took possession of Brazil, and Albuquerque established Port. rule in the E. Indies.

**Embalming,** in anc. Egypt, **2369.**

**Embankment, The,** of the Thames, **2053.**

**Embargo,** in international law, **1140, 437.**

**Embar'go Act,** (U.S., 1807), **1140, 1883, 3671.**

**Embarrass River.** In s.e. Ill.; 150 mi. long; enters Wabash R. 7 mi. w. of Vincennes.

**Em'bassy, 1013.**

**Embez'zlement.** The fraudulent appropriation of money or other personal property by one employed in official capacity.

**Embroidery, 1140;** Bayeux Tapestry, **2513.**

**Em'bryo,** young of plant or animal in earliest stages of development from seed or egg, **394;** of flowering plants, **3173;** formed by cell division, **1141, 672;** growth in bean, *pictures*, **348;** in corn seed, *picture*, **890.**

**Embryol'ogy,** science dealing with development of plant or animal from original germ cell, **1140–1, 396, 398;** founded by von Baer, **3841;** gill-slits in vertebrate embryos, **3634;** of plants, **473;** supports theory of evolution, **1209.**

**Em'den.** A fortified seaport in n.w. Prussia; pop. 13,000; at mouth of Ems R.

**'Emden',** cruiser in World War, **2423, 3796.**

**Em'erald,** a precious stone, **1409, 1410;** Colombia, **836, 3289.**

**Emerald Isle, 1807.**

**Emergency Fleet Corporation,** established by U.S. govt. in 1917, with Gen. George W. Goethals as managing director, **3803.**

**Emerson, Ralph Waldo** (1803–82), Amer. philosopher, essayist, and poet, **1141–2, 1178, 113, 470;** aids women's rights movement, **3778;** and Louisa May Alcott, *picture*, **1143;** and Hawthorne, **1607;** home in Concord, **856;** quoted, **116.**

**Em'ery,** a very hard mineral, **1142.**

**Emet'ics, 2855, 1270.**

**Emigra'tion,** departure from one country to settle in another; from Europe, **1194;** Ireland, **1810;** Italy, **1840;** Scandinavian countries, **3134.** *See also in Index* **Immigration.**

**Emigrés** (*ā-mē-grā'*), in Fr. Rev., **1368.**

**'Emile'** (*ā-mēl'*), novel by Rousseau, **3071.**

**Emil'ia,** division of n. Italy s. of the Po and n. of Tuscany; pop. 2,809,187; 7993 sq. mi.; **1840.**

**Emily,** in Chaucer's 'Knight's Tale', **704–6.**

**Eminent domain.** The right of a state, by virtue of its sovereignty, to control and appropriate private property for public uses; by this right private land is often "condemned" for the building of railroads, canals, etc., and the owner paid "a just compensation."

**Emin Pasha** (*ĕm'ĭn pä-shȧ'*) (1840–92), Turkish name of Eduard Schnitzer, Ger. explorer and administrator in Africa; **3339.**

**Emis'sion spectrum, 3312.**

**Emission theory of light.** Same as **Corpuscular theory.**

**Emma** (born 1858). Queen of William III of the Netherlands and mother of Queen Wilhelmina; regent 1890–98.

**Emmanuel.** Same as **Immanuel.**

**Emma Willard School,** at Troy, N.Y., **3545.**

**Emmenthal,** fertile valley in canton of Bern, Switzerland; 25 mi. long, 11 mi. wide; **3416.**

**Em'met, Robert** (1778–1803). Irish revolutionist; led an unsuccessful revolt against Dublin Castle; escaped but returned to his betrothed, Sarah Curran; was caught and hanged.

**Emmett, Daniel Decatur** (1815–1904), Amer. actor and song writer, originator of "negro minstrel" performances; author of 'Dixie', **2405.**

**Emory and Henry College.** Meth. Episc. institution at Emory, Va.; men; founded 1835 (opened 1838); arts and sciences.

**Emory College.** Meth. Episc. institution for men at Oxford, Ga.; founded 1836; arts and sciences.

**Emotions,** in psychology, **2930;** affected by smell, **3252.**

**'Emotions',** a Little Talk by Arthur Mee, **1144.**

**Empedocles** (*ĕm-pĕd'ō-klēz*) (490?–430 B.C.). Great Gk. philosopher, poet, statesman, superhuman character in legend, said to have cast self into crater of Mt. Etna. (Read Matthew Arnold's 'Empedocles on Etna').

**Emperor penguin, 2716.**

**Empire, Eastern.** *See in Index* **Byzantine Empire.**

**Empire, Holy Roman.** *See in Index* **Holy Roman Empire.**

**Empire Day.** A holiday, May 24, (the birthday of Queen Victoria), which is observed throughout the Brit. Empire by suitable exercises; originated 1897 by Mrs. Fessenden of Hamilton, Ontario; designed to stimulate patriotism and further imperial movement.

**Empire State, 2479.**

**Empire State of the South, 1431.**

**Empir'icists,** in philosophy, **2772.**

**Employers' liability, 1145.**

**Empo'ria,** Kan. City 53 mi. s.w. of Topeka; pop. 11,273; home of *Emporia Gazette*, edited by William Allen White; College of Emporia.

**Emporia, College of.** At Emporia, Kan.; co-ed., Presb.; founded 1882; arts and science, pre-medical and pre-engineering courses, music.

**Ems** (*ĕmz*) or **Bad Ems.** A health resort on Lahr R. 10 mi. e. of Coblenz; pop. 6791; from here was sent "Ems dispatch"; occupied by Amer. army following World War.

**"Ems dispatch," 1355, 427.**

**Ems River,** in Westphalia and Hanover, Prussia; flows n.w. 200 mi. to North Sea; irrigates surrounding country by a series of canals; **1439,** *map*, **1440.**

**Emu** (*ē'mū*), large Australian running bird, **1145**; classified, **2603**; egg, *picture*, **1091**.
**Emul'sion**, a liquid mixture in which a fatty substance is suspended in minute globules, **3263**; in digestion, **1011**.
**Enamel**, of teeth, **3452**, *picture*, **3453**.
**Enameling**, coating metal, glass, or pottery with a glassy composition, **1145–8**, **2906**; bronze vase, *picture*, **1874**; champlevé, **1146**; cloisonné, **1145–6**, **2387**; Hindu, **1755**; Japanese, **1876**; watch dials, **802**.
**Enamel paints**, **2643**.
**Encaus'tic tile**, **505**.
**Enchanted Mesa**, N.M., **2464**.
**Enc'ke's comet**, **850**.
**Encyclopedia** (Gk. "education in a circle"). To the Greeks it meant the circle of knowledge which an educated man had to study; first encyclopedia in modern sense (book or set of books presenting subjects in alphabetical order) appeared in France, 1674. 'Chamber's Cyclopædia', first important Eng. encyclopedia, appeared in 1728; it was basis of famous Fr. 'Encyclopédie' of Diderot and his associates. 'Encylopædia Britannica, first issued 1771.
**Encyclope'dists**, writers of great Fr. encyclopedia, including Diderot and other distinguished thinkers of 18th cent.; influence, **1367**, **1365**.
**En'dicott** or **Endecott, John** (1588?–1665), leader of Puritan settlement at Salem, **2164**, **2170**; b. England; gov. of Mass. Bay Colony nearly half the time between 1629 and his death.
**Endicott Range**, Alaska, western extension of Rocky Mts. (4000 to 6000 ft.), **76**, *picture-map*, **75**.
**Endive**, an annual plant of the family *Compositae*; probably native of East Indies, but cultivated in Europe since 16th cent.; curled or narrow-leaved varieties most used for salads; **823**.
**En'docarp**, shell of a fruit pit, **1380**.
**En'dolymph**, fluid in labyrinth of the ear, **1057**.
**En'dosperm**, nutritive material surrounding embryo in many seeds, **3173**.
**Endymion** (*ĕn-dĭm'ĭ-ŏn*), in Gk. myth., beautiful youth sleeping forever in a cave on Mt. Latmos, beloved and nightly visited by Selene, moon goddess; subject of poem by Keats, **1914**.
**Energy**, **1148–9**, **4029**; conservation of, **1148**, **2786–7**; derived ultimately from sun, **1149**, **3392**, **394**; kinetic, **4029**; plants store "food energy," **2824**, **394**, **2511**; potential, **4029**; radio-active, **2959**; released by explosives, **1211**; steam engine transforms, **1621**, **3348**; useful forms dissipated, **2787**.
**Enfield**, Conn. Center of extensive tobacco-growing region; 18 mi. n. of Hartford on Connecticut R.; pop. 11,719; makes carpets, bricks.
**Enfield rifle**, **1256**, *picture*, **1255**.
**Engadine** (*ĕn-gä-dēn'*), valley of Inn R. in e. Switzerland; 60 mi. long; noted for picturesque scenery and health resorts; **3417**, **3414**, *map*, **3415**, *pictures*, **3413**, **3420**.
**En'gels, Friedrich** (1820–95), Ger. socialist, co-author with Marx of the 'Communist Manifesto', **2157**.
**Enghien** (*äṅ-gĭäṅ'*), **L.A.H. de Bourbon, Duc d'** (1772–1804). Fr. émigré prince, last of the Condés, seized on neutral land as conspirator and executed by Napoleon's order though proved innocent. "It was worse than a crime," said Fouché, "it was a blunder."
**Engine**, machine for creating or applying mechanical power. For types of engine *see in Index* types by name, as **Gas engine, Steam engine, Turbine**, etc.
**Engineer Corps**, U.S., **217**, **3599**; insignia, **3578**, *picture*, **3576**.
**Engineering**, **1149–50**; an applied science, **3144**; basic principles of all machines, **2187–90**, **1148–9**, **1370**; branches of, **1149**; bridge building, **505–9**; building construction, **528–32**, **176–89**, **174**; canal construction, **625–7**, **2650–63**, **3384**, *picture*, **2583**; compressed air devices, **2847**; dams, **954**; dredges and steam shovels, **1039–41**; electrical, *see in Index* **Electricity**; harbors and docks, **1578–9**; irrigation and reclamation, **1827–30**; jetties, **1888**; metal working and woodworking machinery, **3514–6**; mines and mining, **2248–51**; railroad, **2964**; rivers and flood control, **3023**, **1888**, **2266**, **2268**, **970**; road building, **3026–7**; Roman achievements, **163–4**, **3023**, **177**; ship designing, **3216–7**; tunnels and subways, **3550–2**; water supply of cities, **3703–4**, **163–4**.
**Engineers for Rivers and Harbors, Board of**, U.S., **3599**.
**England**, the southern part (not including Wales) of the isl. of Gt. Brit.; 50,874 sq. mi.; pop. 35,000,000; cap. London; **1150–61**, *Study Outline*, **3901**; *maps*, **1152**, **1159**, **1196–7**; architecture, **187**, **188**; Christmas customs, **758–9**; coöperative societies, **879**; costume, development of, **898**, **900**, **1598**; education, **3138–40**, **832**, **2608–11**, **1468**, **3752**; geological history, **1191**, **1720**, **2528**; immigration, **1154**; national song, **2404**; origin of name, **636**, **1152**; painting, **2631**, **2632**; religion, **636**; rulers of, *table*, **1152**.
*Foreign trade*, **1154–5**, **853**, **1160**; Argentina, **192**, **853**; Australia, **265**, **269**; coal, **853**, **2449**; iron ore, **1820**; New Zealand, **2499**; principal ports, **510**, **2031–2**, **2048–56**, **2134**, **2841**, **3290**; Siam, **3227**; tea, **3445**.
*Geography and industries:* chief cities and mfrs., **1150**, **1158**, **1160** (*see also* under names of cities); canals, **1985**; cap. London, **2048–56**; climate, **1549**; coal, **1150**, **1158**, **814**, **427**, **1985**, **2134**, **2449**, **3200**; farm products, **1150**; fisheries, **1150**, **1283**, **1286**, **2528**; forests, **1157–8**; iron and steel, **1158**, **1160**, **1820**, **1826**, **427**, **2449**, **3200**; population, **1150**, **1194**, **770**, **2880**, *map*, **1190**; porcelain and pottery, **2883**, **2906**; rainfall, *map*, **1190**; rivers and canals, **1150**, **625–6**, **1985**, **2134**, **3482**; shipping, **3219**, **3218**; surface and climate, **1150**, **1157**, **1188**; textile mfrs., **1158**, **902**, **1985**, **2134**, **3235**, **3236**; tin, **3504**.
*Government:* cabinet, **555**; common law, **1972**; courts, **909**, **1903–5**, **1972**; factory laws, **1218**, **729**; freedom of press, **2918**, **2474**; liquor laws, **2920**; Magna Carta, **2121**; national debt, **2399**; old age pensions, **2722**; Parliament, **2687–9**; police, **2865**; political parties, **2869**; poor-laws, **2878–9**; postal system, **2898**; spirit of liberty, **1154**, **1161**, **1196**; tariff, **3437**; veto power of king, **3636**; woman suffrage, **3779**.
**England, Church of**, founded, **636**; under William Rufus, **3740**; John, **1896**; Henry II and Becket, **1634**, **358**; Wyclif, **3817**; Henry VIII becomes head of, **1636**; under Edward VI, **1089**; reaction to Catholicism, **2157**; Elizabeth reforms, **1137**; King James Bible, **389**, *picture*, **390**; Puritan movement, **2937**, **2175**, **692**; dispensations of James II, **1861**; disestablished in Ireland, **1468**, **1811**; Oxford movement, **2462**; disestablished in Wales, **3664–5**.
**England, history of**, general sketch, **1151–7**; chief events summarized, **1658–9**, **1661**, **1156**.
*To Norman Conquest* (1066): prehistoric remains, **3361**, *pictures*, **515**, **3360**; Celtic people and religion, **673–4**; Rom. conquest, **1152**, **564**, **3047**, **3048**, **2056**; Teutonic conquest, **1152**; Arthurian legends, **223**, **3664**; Christianity introduced, **1152**, **636**; Danish invasions, **1152**, **90**, **639**, **1087**; Alfred's reforms, **90**; end of Anglo-Saxon period, **1087**.
*Under Norman kings* (1066–1154): Norman conquest, **1152–3**, **3739**, **1589**, **1595**; feudalism established, **3739**, **1235–6**, **654–6**, **1933–5**; feudalism at its height, **3352**, serfdom, **3249**; beginning of jury system, **1905**; misgovernment of William II, **3740**; Henry I, **1633**; Stephen and Mathilda struggle for crown, **3352**.
*Struggle for constitutional liberty* (1154–1337), **1153**; reforms of Henry II, **1633–4**; Richard I and the Crusades, **3015–6**; Magna Carta, **1896**, **2121**; Barons' Wars, **1634**, **2316**; rise of Parliament, **2316**, **1087**, **2687**; Wales conquered, **1087**, **3664**; wars in Scotland, **3148**, **1088**, **3667**, **518**.
*Hundred Years' War and Wars of the Roses* (1337–1485), **1699–1700**, **2763**, **1893–4**, **1634**, **42**; Black Death, **433**, **48**; Wat Tyler's rebellion, **3571–2**; serfdom ended, **3249**; increase of Parliament's power, **1088**, **3016**, **1634**; Wyclif and the Lollards, **3817**; Wars of the Roses, **3066**, **3068**, **1088**, **3016–7**.
*Renaissance and Reformation* (1485–1603): the new Tudor monarchy, **1635**; Star Chamber, **3344**; Cabot's voyages to the New World, **561–2**; Renaissance, **1164**, **2995–7**; Henry VIII and the Reformation, **1635–6**, **2988**, **1089**; Wolsey, **3775–6**; More, **2325–6**; Mary and the Catholic reaction, **2157**; Elizabethan Age, **1136–8**; 16th cent. costumes, **898**, **900**; war with Spain (1588), **210–1**, **1031**, **1137**, **2763**; Mary Queen of Scots, **2158–60**; growth of sea power, **1137**, **1153**, **1030–1**; exploration and colonizing ventures, **1153**, **1030–1**, **2974–6**, **2520–1**, **2450**.
*Puritan Revolution and the Restoration* (1603–89): Scotland and England united, **3372**; struggle between Parliament and the Stuarts, **1860–1**, **691–3**; Gunpowder Plot, **1228**; first newspaper, **2474**; Puritans, **2937**; settlements in America, **1861**, **3252–3**, **2175–8**, **2841–2**, **472–3**, **2716–7**, **2497**; Civil War and Commonwealth, **924–6**, **693**, **3148–9**, **2242**, **2689**, **1808**; Hampden, **1570**; war with Dutch Netherlands, **435**, **2427**, **2442**; Restoration, **694**; Habeas Corpus Act, **1557**; coffee, tea, and chocolate introduced, **755**, **820**; James II and the "Glorious Revolution" of 1688, **1861**; Bill of Rights, **393**; Toleration Act, **2937**.
*Foundation of the British Empire* (1689–1763): wars with Louis XIV, **3741**, **2066**, **2150**, **139**; treaty of Utrecht, **3612**; union with Scotland, **139**, **1510**; rise of political parties, **2869**; house of Hanover, **1428**, **1576**; Jacobite risings, **2914–5**; Seven Years' War, **3180–1**, **700**, **2147**, **1360**; French and Indian War, **1362**, **2312**, **3775**; expansion of empire, **513**, **1154**, **1692**; India **1753**, **795–6**; improvements in agriculture, **48**.
*Revolutionary Epoch* (1763–1815): reaction under George III, **1428**, **1430**; Stamp Act, **3337–8**; Amer. Rev., **3000–4** (*see also in Index* **Revolutionary War**); Burke, **540**; Pitt, **2812**; wars with France and Napoleon, **1368**, **1370**, **2393–6**, **117**; Nelson and naval supremacy, **2427**, **2435**; Wellington, **3717**, **3699–3700**; colonial expansion, **513**, **872**, **874**, **3280**; slave trade abolished, **3249**; War of 1812 with U.S., **3670–3**; Industrial Revolution, **1778**, **1154–5**, **1218**, **728–9**, **3023–4**, **625–6**, **3526**.

*Reform and the Victorian Era* (1815–1901): Catholic Emancipation Act, **2559, 2706;** Reform Bill (1832), **2688, 3083, 2869;** slaves emancipated, **3249;** factory laws, **1218, 729;** poor-law reform, **2878;** railroads and steamships, **2962–3, 3526, 3210;** postal system developed, **2896, 2898, 3337;** Corn Laws repealed, **1155, 2706, 2869;** Crimean War, **922, 3560, 3084;** Queen Victoria's influence, **3639–40;** rival policies of Disraeli and Gladstone, **1013, 1468;** Indian mutiny, **1753;** Canadian confederation, **618;** Irish Home Rule, **1811, 2689–90, 1468;** Employers' Liability Act, **1145;** occupation of Egypt, **1097, 1489, 1929;** Boer War, **446–7, 3282.**

*The twenticth century:* Lloyd George's reforms, **2039–40, 2722;** socialism, **3269;** Triple Entente, **1089;** naval power threatened by Germany, **3738, 3790, 1196;** World War and peace settlement, **3789–3812, 3967, 2040–1, 1662;** separate parliaments established for Ireland, **1811.** *See also in Index* **British Empire; Ireland; Middle Ages; Scotland; Wales; World War;** and names of chief events and persons.

**"England expects that every man will do his duty,"** 2435.

**Englewood,** N.J. Residential city on w. slope of Hudson Pallsades, 13 mi. n. of Jersey City; pop. 11,627.

**'English Bards and Scotch Reviewers',** satire by Byron, **551.**

**English Channel,** separates England from France; breadth 20 to 100 mi.; length, 350 mi.; **2528,** *maps,* **1159, 1196–7;** between Dover and Calais, **1027;** strategic importance, **1509.**

**English elm,** 1139.

**English horn,** a musical instrument, **3781, 2383, 2591.**

**English language, 1161–2, 2770–2;** alphabet, **100–1;** Arabic words, **2278;** Bible translations, influence, **3817, 389, 1162;** Chaucer's influence, **702;** dictionaries, **1898–9, 3314–6;** grammar, **1492–5;** Greek words, **1534, 1162;** Latin words, **1965, 1162;** origin of personal names, **2388–9;** rhetoric, **3004–5;** spelling, **3314–6, 3711–2.** *See also in Index* **Grammar.**

**English literature, 1163–8,** *Study Outline,* **4002;** beginnings, **1163, 384, 563;** Chaucer, **701–2;** development of drama, **1164, 1165, 1033–6, 3188–91;** Dryden and the 18th cent., **1165–6, 1043, 2539–40;** essay, **1177–8;** novel, **2539–41, 1167;** Puritan influence, **1165, 2240;** romances, **2539, 3039;** Romanticism, **1166–7, 3788;** Shakespeare and the Age of Elizabeth, **1164, 1137–8, 2539;** Victorian Age, **1167, 2540, 1178.**

**English sparrow,** 3308, **426,** *picture,* **418;** how he gets his black throat, **410.**

**English type,** 3572.

**English walnut,** 2545, 3667.

**Engraving, 1168–72;** cave-man art, **668,** *pictures,* **666, 668;** Dürer's influence, **1048;** etching, **1168–70;** of gems, **591;** half-tones, **1170,** *pictures,* **1169, 1171;** Japanese, **1876,** *picture,* **1875;** line, **1168;** lithography, **2030, 1170;** mezzotint, **1170;** of paper money, **2284;** photogravure and rotogravure, **1172;** stipple, **1170;** wood, **1168, 1876, 2916, 643;** zinc etching, **1172.**

**Engraving and Printing, Bureau of,** U.S., **3598, 2284.**

**E'nid,** Okla., city about 75 mi. n. of Oklahoma City, center of agricultural, stock-growing, and oil region; pop. 16,576; **2576.**

**Enniskil'len** or **Inniskilling.** Market town in n. Ireland; defeated James II's forces at battle of Crom 1689; famous cavalry regiment "Inniskilling Dragoons" formed by defenders.

**Ennius** (*ĕn'i-ŭs*), **Quintus** (239–169 B.C.), Latin epic poet, called "father of Rom. poetry," **1966.**

**Enoch** (*ē'nŏk*). Hebrew patriarch who "walked with God" and after 365 years "was not, for God took him" (Gen. v, 18–24).

**'Enoch Arden'.** *See in Index* **Arden.**

**Enschede** (*ĕn'sĸā-dĕ*), Netherlands. Mfg. town near e. border; pop. 41,000; cotton-spinning, weaving, etc.

**En'sign,** in U.S. Navy, **2426,** insignia, *picture,* **3577.**

**En'silage.** *See in Index* **Silos and silage.**

**Entab'lature,** in architecture, **177,** *picture,* **180.**

**Entail,** law restricting inheritance to a particular heir or class of heirs; abolished in Va., **1882.**

**Enteb'be,** Brit. cap. of Uganda Protectorate, Africa, on n.w. shore of Victoria Nyanza, **3641, 1069.**

**Entente** (*äṅ-täṅt'*), **Triple, 1089, 1196, 3529.**

**Entomol'ogy,** the science of insects; services to agriculture, **47;** work of Fabre, **1217–8.** For complete references *see in Index* **Insects.**

**Entomology, Bureau of,** U.S., **3600.**

**Entrepreneur** (*äṅ-tr-prĕ-nûr'*), in economics, **1077.**

**Envi'ronment,** and heredity, **1644;** changes in prehistoric times, **132, 136, 795, 1420, 1721;** climatic environment affects plants, **795;** forms subject-matter of ecology, **1076, 473;** effect upon evolution of isolating a region, **265–6, 1908, 3439;** influences structure and life-processes of animals, **100, 1420;** of plants, **795, 562, 855, 3700;** plant "societies" corresponding to environments, **1076, 3700.** *See in Index* **Adaptation; Ecology; Evolution.**

**Enzyme** (*ĕn'zīm*), organic substance which in solution produces chemical change in other substances apparently without being changed itself, **1172–3;** action resembles catalysis, **2831;** in digestion, **1010–1, 1469;** in fermentation, **1232;** in malt, **2131;** pepsin, **2724.**

**Eocene** (*ē'ō-sēn*) **period,** in geology, **1418,** *picture,* **1419.**

**Eohippus** (*ē-ō-hĭp'ŭs*), ancestor of the horse, **1683,** *picture,* **1682.**

**Eos** (*ē'ŏs*), Gk. name for Aurora, **259.**

**Epaminondas** (*ē-păm-ĭ-nŏn'dàs*) (418?–362 B.C.), Theban general and statesman, **3486, 1525.**

**Ephemerida** (*ĕf-ĕ-mĕr'i-da*), an order of winged insects such as mayflies, **1788.**

**Ephesus** (*ĕf'ĕ-sŭs*), anc. Gk. city, greatest of 12 on coast of Asia Minor; Temple of Artemis (Diana), one of Seven Wonders of World, **3178, 221,** *picture,* **3179.** Also seat of 2 notable church councils in 5th cent.; St. Paul labored there 3 years (Epistle to the Ephesians).

**Ephialtes** (*ĕf-i-ăl'tēz*), a Malian, traitor at battle of Thermopylae, **3487.**

**Ephors** (*ĕf'ôrs*), Spartan officials, **3309.**

**Ephraim** (*ē'frā-ĭm*). Hebrew patriarch, younger son of Joseph; ancestor of tribe of Ephraim (Joshua xvi).

**Ephraim Mt.** In Palestine, 25 mi. n. of Jerusalem; one of the many low peaks in the ridge extending s. from Lebanon Mts.

**Ep'ic poetry,** defined, **2851;** English, **1163, 1164, 1165, 384, 2243, 2244–6;** Finnish, **1248;** French, **1364, 3038;** German, **1436, 2504;** Greek, **1535, 1675–6;** Italian, **1832, 1833, 958–60, 3440;** Latin, **1966, 1967, 3630;** Portuguese, **2889;** Sanskrit, **1755;** Spanish ('Cid'), **3307.**

**Epic poetry, muse of,** 2373.

**Epictetus** (*ĕp-ĭk-tē'tŭs*), Gk. stoic philosopher of first cent. A.D., **1173.**

**Epicure'ans,** 2772.

**Epicurus** (*ĕp-i-kū'rŭs*) (342–270 B.C.), Gk. philosopher who taught that the chief good of life is pleasure, but that true pleasure comes from the practice of virtue, **2772.**

**Epidem'ic.** A disease widespread for a time in a certain region; opposed to **endemic disease,** one continually prevalent in a region.

**Epider'mis,** of human skin, **3245, 3246;** of leaf, *picture,* **1980.**

**Epiglot'tis,** lid at base of tongue that covers the larynx during act of swallowing; how it works, *picture,* **2793.**

**Epigynous** (*ĕ-pĭj'i-nŭs*) **flowers,** 3939.

**Epimetheus** (*ĕp-i-mē'thūs*), in Gk. myth., brother of Prometheus and husband of Pandora, **2663, 2664.**

**Epiphany** (*ĕ-pĭf'à-nĭ*), a festival of the Christian church on January 6 in commemoration of the showing (Gk. *epiphania*) of Christ to the Magi, **759.**

**Epiphytes** (*ĕp'i-fīts*), or air plants, **69.**

**Epirus** (*ĕ-pī'rŭs*), anc. dist. of n. Greece along Ionian Sea; under Pyrrhus, **2941;** *map,* **1518.**

**Epis'copal church.** *See in Index* **Protestant Episcopal church.**

**E Pluribus Unum** (Latin, "one out of many"). National motto of U.S.; suggested by Franklin, Adams, and Jefferson, members of committee of Continental Congress appointed to design seal of U.S.

**Epping Forest,** England, **1158.**

**Ep'som,** England. Resort 15 mi. s.w. of London; pop. 20,000; mineral springs from which Epsom salts were first obtained; famous horse races.

**Epsom salt,** 3116.

**Ep'stein, Jacob** (born 1880), Eng. sculptor, b. New York, studied under Rodin; realist and extremist; **3164.**

**Ep'worth,** England, small town in Lincolnshire, birthplace of John Wesley, **3718.**

**Epworth League.** An organization of young people of the Meth. Episc. church, formed 1889 in Cleveland, Ohio, by combination of five organizations.

**Equality State,** 3347.

**Equa'tion,** in algebra, **92, 94.**

**Equa'tor,** in geography, **1968, 3861;** crossed by sun at equinoxes, **1173;** heavy rainfall, **2972;** region of little wind, **3750,** *picture,* **3751.**

**Equato'rial mounting** of telescopes, **2551.**

**Equidae** (*ĕk'wĭ-dē*). *See in Index* **Horse family.**

**Equilib'rium,** state of balance; balancing organs of human ear, **1057,** *picture,* **1056;** center of gravity determines, **1509;** gyroscopic stabilizers, **1555–6.**

**E'quinox,** time of year when the sun is equidistant from both poles, **1173;** how fixed, *picture,* **1063;** vernal equinox fixes date of Easter, **1070.**

**Equinoxes, precession of,** slow shift in time of year when poles are equidistant from the sun, **1173;** illustrated by gyroscope, **1556;** shifts relation of zodiac to calendar, **3840.**

**Equisetum** (*ĕk-wĭ-sē'tŭm*), genus of horsetail rushes, **3083;** related to ferns, **1234.**

**Eq'uity,** in English law, **1972, 909.**

**Equus** (*ē'kwŭs*), animal genus including the ass, **235–6,** horse, **1685,** zebra, **3838.**

**E'ra, geologic, 1418, 1420.**

**Era of Good Feeling,** in U.S. history, **2307.**

**Erard** (*ā-rär'*), **Sébastien** (1752–1831), Fr. maker of musical instruments, **1589.**

**Erasmus** (*ē-räz'mŭs*), **Desiderius** (1466–1536), Dutch scholar and theologian, **2996, 2987, 1164,** *picture,* **2636;** friends, **1049, 1672, 2325;** influence on Zwingli, **3842;** statue in Rotterdam, **3068.**

**Erato** (*ĕr'ȧ-tō*), in Gk. myth., muse of love poetry, **2373,** *picture,* **156.**

**Eratosthenes** (*ĕr-ȧ-tŏs'thē-nēz*) **of Alexandria** (276?–194 B.C.), Gk. scientist, chief librarian of Alexandrian Library; first real maps, **1416;** calculated earth's circumference, **1064.**

**Er'bium,** a rare element, **4042.**

**Erckmann-Chatrian** (*ĕrk-män'-shä-trē-äṅ'*). Signature of Fr. literary collaborators, Emile Erckmann (1822–99) and Louis Gratien Charles Alexandre Chatrian (1826–90); writers of novels, short stories, dramas ('Madame Thérèse'; 'L'Ami Fritz').

**Er'ebus.** In classical myth., the dark space between the earth and Hades.

**Erectheum** (*ĕr-ĕk-thē'ŭm*), temple on Acropolis, **11,** *picture,* **250.**

**Erectheus** (*ē-rĕk'thūs*), legendary king of Athens, **11.**

**Erfurt** (*ĕr'fụrt*). City in cent. Germany, 70 mi. s.w. of Leipzig; pop. 130,000; in flower and vegetable-growing and seed-exporting region; formerly had famous univ.

**Erg** (*ĕrg*). The unit of work; work done in moving one gram against a resisting force of one dyne; 1000 ergs equal one joule, the practical unit.

**Ergot** (*ēr'gŏt*), rye fungus, **3102.**

**Erica'ceae,** the heath family, **1621, 3942.**

**Er'icson** or **Ericsson, Leif** (11th cent. A.D.), Norse adventurer; discovers N. Amer., **2526, 109.**

**Ericsson, John** (1803–89), Swedish-Amer. inventor and engineer, **1173–4, 2287, 3212.**

**Eric the Red** (10th cent.), Norwegian navigator, father of Leif Ericson, colonizer of Greenland, **2526, 1540.**

**Eridanus** (*ē-rĭd'ȧ-nŭs*), anc. name of R. Po, **2759.**

**Erie** (*ē'rĭ*), Pa., lake port 88 mi. s.w. of Buffalo, N.Y.; pop. 93,372; largest harbor on L. Erie; steam engines; large fishing interests; **2720, 2721, 2730.**

**Erie, Lake,** shallowest and stormiest of the Great Lakes, **1174, 1510–4,** *map,* **1511;** commerce, **2568, 2570, 2720, 527, 792, 1000, 3511;** fisheries, **1286;** Welland Canal, **3716.**

**Erie, Lake, battle of** (Sept. 10, 1813), **2730, 3672, 1174.**

**Erie Canal,** N.Y. State, completed in 1825; connecting L. Erie with Hudson R.; **627, 2484, 1514, 164,** *picture,* **625.**

**Erigena** (*ē-rĭj'ē-nȧ*), **Johannes Scotus** (800?–877?). Medieval (Irish) philosopher and theologian (later branded as heretic); head, under Charles the Bald, of the palace school founded by Charlemagne.

**Erin** (*ē'rĭn*). Anc. name for Ireland, now used poetically.

**Erinyes** (*ĕ-rĭn'-ĭ-ēz*), Gk. name of the Furies, **1382.**

**Eris** (*ē'rĭs*), in Gk. myth., goddess of discord, **3542.**

**Eritrea** (*ē-rĭ-trē'ȧ*), Ital. colony in n.e. Africa, on Red Sea; 45,800 sq. mi.; pop. 450,000; exports hides, mother-of-pearl, vegetable ivory, salt; *map,* **40–1.**

**Erivan** (*ĕr-ĭ-vän'*), largest city of Armenia, 110 mi. s. of Tiflis; pop. 90,000; on caravan route between Russia and Persia; **664.**

**Erl-king** or **Erlkönig,** in Teutonic folk-lore, a malicious being who haunts the forest and carries away children, **3143.**

**Er'mine,** fur-bearing animal of weasel family, **1174;** fur, **1389, 1390.**

**'Ernani'** (*ĕr-nä'nē*), opera by Verdi, **3628.**

**Ernest Augustus** (1771–1851). King of Hanover, 5th son of George III of England; succeeded to Hanoverian throne 1837 (males alone being eligible), separating Eng. and Hanoverian crowns after personal union of over 100 years.

**Eros** (*ē'rŏs*), Gk. name for Cupid, **939–40.**

**Eros,** an asteroid, **237,** *picture,* **238.**

**Ero'sion,** in Bad Lands, **3296;** glacial, **1721, 3831;** mountains, **2790, 2791, 2358, 3658, 1970;** by rivers, **3022, 2791, 3615, 639, 1803;** soil formation, **3273;** by winds, **3750.**

**Erse,** language of Scotch Highlanders, **674.**

**Erskine Falls,** Australia, *picture,* **269.**

**Erup'tions,** volcanic, **3657–60.** *See also in Indcx* **Volcanoes.**

**Erymanthian** (*ĕr-ĭ-măn'thĭ-ăn*) **boar,** in Gk. myth., slain by Hercules, **1640.**

**Erysipelas** (*ĕr-ĭ-sĭp'ĕ-lȧs*), a skin disease; caused by bacteria, **1450.**

**Eryth'ia,** in Gk. myth., isl. beyond Strait of Gibraltar, home of monster Geryon, **1640.**

**Erzberger** (*ĕrts'bĕrĸ-ĕr*), **Matthias** (1875–1921). Leader of Democratic Catholic party in Ger. Reichstag; sec. of state 1918 succeeding Bethmann-Hollweg; negotiated armistice terms ending World War; minister of finance 1919; assassinated.

**Erzerum** (*ĕrz'rụm*). Anc. city in Turkish Armenia; pop. 80,000; copper and iron wares; capture by Russians in World War (Feb. 1916) ended projected Turkish invasion of Egypt.

**Erzgebirge** (*ĕrts'gē-bĭr-gĕ*) ("Ore Mountains"), low range between Saxony and Bohemia, **3131, 270,** *map,* **271.**

**Esarhaddon** (*ē-sär-hăd'ŏn*) (d. 668 B.C.), king of Assyria; son of Sennacherib and father of Assurbanipal; brought Egypt under Assyrian rule, rebuilt Babylon; enlarged Assyrian Empire; **1656.**

**Esau** (*ē'sạ*), son of Isaac and Rebekah and elder twin brother of Jacob; hairy hunter who sold his birthright to his brother for a mess of pottage and was cheated by the wily Jacob (Gen. xxv, xxvii); founds Edomites, **1889, 1988.**

**Esbjerg** (*ĕs'byĕrĸ*), Denmark, seaport on w. coast of Jutland; pop. 19,000; submarine cable connects with Calais; exports, **994.**

**Es'calator,** a "moving stairway," **1132.**

**Escana'ba,** Mich., city on inlet of Green Bay, L. Michigan; pop. 13,103; summer resort; good harbor; **2226.**

**Escarp'ment,** in geology, the steep face of a cliff, usually caused by erosion or by prehistoric changes in water line; Niagara escarpment, **2503.**

**Esch** (*ĕsh*), **John J.** (born 1861). Amer. statesman and lawyer, joint author of Esch-Cummins Law returning U.S. railroads to private owners 1920; b. Norwalk, Wis.; judge-advocate-general with rank of colonel 1894–96; U.S. House of Representatives 1899–1921.

**Eschenbach** (*ĕsh'ĕn-bäĸ*), **Wolfram von.** *See in Index* **Wolfram.**

**Esco'rial,** Span. royal palace near Madrid, **2110.**

**Escutch'eon,** in heraldry, **1639.**

**Esdraelon** (*ĕs-drȧ-ē'lŏn*), **Plain of,** the greatest plain of Palestine; fertile, level, roughly triangular, bounded by Mt. Carmel on w., **Mt.** Gilboa on s.e., highlands of Galilee on n.; scene of many battles in all ages; **2645, 3425.**

**Es'kimo curlew,** or dough bird, **3261.**

**Eskimo dog, 1020, 1023, 1176,** *pictures,* **1020, 1175.**

**Eskimos,** a race whose habitat is the Arctic regions, **1174–7, 190;** in Alaska, **77–9; 2993;** boats, **445,** *picture,* **443;** fat in diet, **1322;** in Greenland, **1539–40;** in Labrador, **1948, 1541;** story, 'A Day's Visit in Eskimo Land', **1175–7.**

**Esna** or **Esneh** (*ĕs'nē*), in Egypt, town on left bank of Nile, 25 mi. s. of ruins of Thebes; active trade post for caravans; Nile barrage, **1094.**

**Esophagus.** *See in Index* **Oesophagus.**

**Espartero** (*ĕs-pär-tā'rō*), **Baldomero** (1792–1879). Span. soldier and statesman; conspicuous for successes against Carlists in 1836–40; then for three years regent for Isabella, child queen; retired from public life 1856; modest man of strongly liberal tendencies.

**Espar'to,** a fibrous grass, native to n. Africa and s. Spain; long used for mats, baskets, rope, sandals; paper, **2667.**

**Esperanto** (*ās-pā-rän'tō*), an international language, **1177.**

**Espérey** (*ĕs-pĕ-rā'*), **Louis Franchet d'** (born 1856), Fr. general; created marshal of France in 1921; commanded 5th Army in first battle of Marne; commander-in-chief at Saloniki in 1918; overcame Bulgaria; **2151.**

**Esquiline** (*ĕs'kwĭ-līn*) **Hill,** highest of the seven hills of Rome, **3056.**

**Esqui'malt,** British Columbia, naval station on Vancouver Isl. about 3 mi. w. of Victoria; pop. 5000; large harbor, naval yards, fortifications; shipbuilding, salmon canning; **3638.**

**Es'quimaux.** Same as **Eskimos.**

**Essad** (*ĕs'sȧd*) **Pasha** (1875?–1920). Turkish soldier, bandit, and provisional president of Albania (1914); killed in Paris.

**Es'say,** in literature, **1177–8;** Addison and Steele, **1165, 1166, 1178;** Amer. nature essayists, **113, 115;** Bacon, **1178, 301, 1164;** De Quincey, **1167;** Dryden, **1043, 1165;** Emerson, **113;** Holmes, **1674;** Dr. Johnson, **1166, 1900;** Charles Lamb, **1958, 1167, 1178;** Lowell, **113, 2074;** Macaulay, **2093, 1178;** Montaigne, **2308, 1177;** Ruskin, **3083, 1178;** Stevenson, **1167.**

**'Essay on Criticism',** poem by Pope, **2879.**

**'Essay on Man',** poem by Pope, **2879.**

**Essen** (*ĕs'ĕn*), Germany, industrial and r.r. center 22 mi. n. of Düsseldorf, in Prussian Rhine Province; whole of Essen depends on Krupp works; **1178, 1443,** *picture,* **1444.**

**Essential oils, 1225;** in perfumes, **2728.**

**Essequibo** (*ĕs-ĕ-kē'bō*), largest r. of Brit. Guiana, S. Amer.; 600 mi. long; flows into Atlantic by estuary 20 mi. wide; *map,* **1547.**

**Es'sex, Robert Devereux,** 2d **Earl of** (1566?–1601), Eng. soldier and courtier; won distinction in war with Spain; later fell into disfavor, tried to excite insurrection, was executed for treason; favorite of Queen Elizabeth, **1138;** patron of Bacon, **300.**

**Essex, Robert Devereux,** 3d **Earl of** (1591–1646). Eng. general, son of preceding; commander of Parliamentary forces 1642–45 in Civil War.

**Essex.** Maritime county in n.e. England; 1542 sq. mi.; pop. 1,410,000; cap. Chelmsford; included in kingdom of E. Saxons; grazing, wheat and barley; extensive mfrs. of all kinds.

**'Essex'**, U.S. frigate, **1225.**
**Essex Junto.** Group of Federalist leaders, including Timothy Pickering, Fisher Ames, George Cabot, and some of the Lowell family, living in Essex County, Mass.; accused by John Adams, whose policies they disapproved, of being a "British faction"; opposed war with England in 1812.
**Es'sling.** Village in lower Austria, 7 mi. e. of Vienna; between it and Aspern occurred bloody battle between French and Austrians 1809.
**Established church,** in England. *See in Index* **England, Church of.**
**Estates-General,** former representative assembly of France, **1178–9, 2762;** meeting in 1789, **1367, 2066;** Mirabeau in, **2259, 1367;** Robespierre, **3027;** Talleyrand, **3430.**
**Este** (*ĕs'tā*), **House of,** old and illustrious family of Italy, capital at Ferrara; famous for political importance and splendid court; encouraged poets, painters, and scholars; Alberto Azzo II (11th cent.) was common ancestor both of House of Este and of House of Guelf, to which royal family of England belongs; Alfonso of Este (1476–1534), duke of Ferrara, husband of Lucretia Borgia, was patron of Tasso, **3440.**
**Estes Park,** Colo., **841–2.**
**Esther** (*ĕs'tẽr*), heroine of the Old Testament book of this name, **1179–80,** *pictures,* **1181, 1892.**
**Esthonia** (*ĕs-thō'nĭ-ȧ*), country in Europe, on Baltic Sea; formerly one of Baltic Provinces of Russia; declared independence 1918; pop. 1,400,000; 20,000 sq. mi.; **1180,** *maps,* **1196–7, 2858.**
**Esthonian language, 1180.**
**Estremadura** (*ĕs-trā-mä-dụ'rą*), province of Portugal, in which Lisbon lies; 6876 sq. mi.; pop. 1,438,726; **2888.**
**Es'tuaries, 1188.**
**Etah,** Greenland. Eskimo settlement on Smith Sound; most northerly village in world.
**Etana** (*ā-tä'nä*), in Babylonian myth., **299.**
**Etching, 1168-70;** on glass, **10;** halftones, **1170,** *pictures,* **1169, 1171, 1172;** rotogravure, **1172;** zinc, **1172.**
**Etchmiadzin** (*ĕch-mē-ȧd'zĭn*) or **Echmiadzin,** village and convent in Armenia, 15 mi. w. of Erivan; residence of head of church, **213.**
**Eteocles** (*ē-tē'ō-klēz*), in Gk. myth., son of Oedipus and brother of Antigone, **2566.**
**Eternal City, 3049.**
**Ete'sian winds, 795.**
**Eth'elbald** or **Aethelbald,** king of Wessex 858–860 A.D., **1152.**
**Eth'elbert** or **Aethelberth,** king of Kent 560–616, bretwalda or overlord over all the English s. of the Humber, and author of the first written Eng. laws; converted by St. Augustine, **636.**
**Ethelfleda** (*ĕth-ĕl-flā'dȧ*) or **Aethelflaed** (d. 917? A.D.). Eldest daughter of Alfred the Great, wife of the Earl of Mercia.
**Eth'elred** or **Aethelred,** king of Wessex and Kent 866–871, brother of Alfred the Great, **1152.**
**Ethelred** or **Aethelred,** "the Unready," king of the English 979–1016, in whose reign Danish invasions were renewed, and policy of paying tribute (Danegeld) was begun; his marriage with the Norman princess Emma "opened a distinct policy which led to the Norman conquest of England"; **1087.**
**Ethelwulf** or **Aethelwulf,** king of Wessex 839–58, father of Alfred the Great, **1152.**
**E'ther,** an anesthetic, **124, 125;** in collodion, **833.**
**Ether** or **aether,** in physics, elastic medium supposed to pervade all space and transmit light, electric phenomena, etc., **1180, 2787, 3706;** development of ether theory by Huygens, **1998,** Clerk Maxwell, **1122, 3766,** Hertz, **1122, 3766,** Einstein, **2000–1,** *picture,* **1999;** electromagnetic (Hertzian or radio)waves, **1122, 1114, 3758–60, 3312, 3763–6;** relation of light, Hertzian, and X-ray waves, **3312, 1122;** theory opposed by Newton, **1998, 2478;** transmits heat, **1620, 3312;** light, **1998, 3312,** X-rays, **3825, 3312.**
**Eth'ics,** a branch of philosophy, **1180, 2772.**
**Ethiopia** (*ē-thĭ-ō'pĭ-ȧ*), name given in anc. geography to countries of Africa s. of Egypt; identified with Hebrew "Cush" of Bible; later applied to Abyssinia and adjacent territories, **3.**
**Ethiopian** or **African race, 2956.**
**Ethio'pic language, 1624.**
**Ethnol'ogy,** science which deals with the races and classification of mankind, **149, 2956;** relation to sociology, **3270.** For detailed analysis and references *see* Study Outline, **3866–9.**
**Eth'yl** (grain) **alcohol, 84.**
**Ethyl chloride,** as an anesthetic, **125.**
**Eth'ylene,** a gaseous compound, **1407.**
**Etiquette** (*ĕt'ĭ-kĕt*), **1183–5;** 'Good Manners', a Little Talk by Arthur Mee, **1182.**
**Et'na** or **Aetna, Mt.,** volcano (10,750 ft.) on e. coast of Sicily, **1185,** *picture,* **3229;** in myth., **1639.**
**Eton** (*ē'tȯn*) **College,** famous Eng. public school at Eton on Thames R. opposite Windsor; founded 1440 by Henry VI; **3752, 3139.**
**Etruria** (*ē-trụ'rĭ-ȧ*). Anc. country n.w. of Rome, inhabited by Etruscans; modern Tuscany.
**Etrus'cans, 1185–6;** conflicts with Rome, **1186, 3040–1, 3494, 3044;** gladiatorial shows, **1466;** influence on Rom. art, **1533.**
**"Et tu, Brute," 565.**
**Etymol'ogy, 2771;** English, **1161–2;** of names, **2388–9.**
**Et'zel,** name of Attila in Ger. legend, **1704, 2504.**
**Euboea** (*yụ-bē'ȧ*), largest isl. in Gk. archipelago; 90 mi. long, 4 to 30 mi. wide; pop. 117,000; chief town Chalcis; minerals, oil, wine, farm products; *map,* **1518.**
**Eucaine** (*yụ-kān'*), a local anesthetic, **125.**
**Eucalyptol** (*yụ-kȧ-lĭp'tōl*), oil from eucalyptus leaves, **1186.**
**Eucalyp'tus,** gum tree native to Australia, **1186–7, 265, 3438,** *pictures,* **1186, 1226;** adaptation to climatic conditions, **1207, 855.**
**Eucharist** (*yụ'kȧ-rĭst*), a sacrament, **764.**
**Eucken** (*oi'kĕn*), **Rudolf Christoph** (born 1846). Ger. idealistic philosopher; urged the "application of a vital religious inspiration to the practical problems of society"; winner of Nobel prize for literature, 1908 ('The Meaning and Value of Life').
**Euclid** (*yụ'klĭd*) (about 300 B.C.), Gk. mathematician, called "father of geometry" ('Elements of Geometry' still used as school textbook), **1422.** King Ptolemy asked whether he could not learn geometry more easily than by studying the 'Elements'. Euclid replied "There is no royal road to geometry."
**Eudox'ia** (422?–463), Rom. empress, daughter of Theodosius II, and wife of Valentinian III, **3618.**
**Eugène** (*ū-zhān'*) **of Savoy, Prince,** (1663–1736). Fr.-born Austrian general and statesman, one of great captains of history; defeated Turks at Zenta (1697), helped Marlborough win at Blenheim and Malplaquet, and took Belgrade from Turks (1717).
**Eugene** (*yụ-ǧēn'*), Ore., center of agricultural, lumbering, and gold and silver mining region on Willamette R. 50 mi. from Pacific; pop. 10,593; fruit canneries and various mfrs.; state univ., *picture,* **2595.**
**Eugenics** (*yụ-ǧĕn'ĭks*). science of race improvement, **1187.**
**Eugénie** (*û-zhā-nē'*) (1826–1920), wife of Napoleon III, emperor of the French; beautiful fascinating woman of non-royal birth (daughter of Span. count of Montijo) whose frivolity, luxury, and extravagance were forgotten in her bereaved and dethroned old age; **2397, 3384.**
**'Eugénie Grandet'** (*grän-dā'*). Novel by Balzac, one of the world's greatest stories; old Grandet, the miser, is probably the most terrible portrayal of the corroding influence of greed in any literature; his daughter, Eugénie, is Balzac's finest female character.
**Eulenspiegel** (*oi'lĕn-shpē-gĕl*). **Till.** Ger. folk-hero of 14th cent., about whose name have gathered popular tales of jests and pranks.
**Eumaeus** (*yụ-mē'ŭs*), in the 'Odyssey', swineherd of Odysseus, **2565.**
**Eumenides** (*yụ-mĕn'ĭ-dēz*), the Furies, **1382.**
**Eupat'rids,** hereditary aristocrats of anc. Greece, **1521.**
**Eupen** (*oi'pĕn*). Town and dist. in e. Belgium 20 mi. e. of Liége; ceded with Malmedy by Germany 1919.
**Euphonium** (*yụ-fō'nĭ-ŭm*), musical instrument, **1681.**
**Euphrates** (*yụ-frā'tēz*) **River,** the 2d largest r. of w. Asia; flows s. and e. 1800 mi. to Persian Gulf; **1187;** basket boats, **445,** *picture,* **443;** Mesopotamia, **2200–1, 295–9.**
**Euphrosyne** (*yụ-frŏs'ĭ-nē*), in Gk. myth., one of the three Graces, **155.**
**Euphues** (*yụ'fū-ēz*), name and hero of a romance (published 1578) by John Lyly, which made the affected artificial style of "fine language" called "euphuism" fashionable in Elizabethan England, **2539.**
**Euplexoptera** (*yụ-plĕks-ŏp'tẽr-ȧ*), an order of insects, **1788.**
**Eura'sia, 227.**
**Eureka** (*yụ-rē'kȧ*) (Gk. for "I have found it"), expression used by Archimedes, **174.**
**Eureka,** Calif., trade center and shipping point on Humboldt Bay and Eel R. in famous redwood region; pop. 12,923; lumber interests, trade in butter, fish, apples, and wool, various mfrs.; **582.**
**Eureka Springs,** Ark. Health resort in n.w. in Ozark Mts.; pop. 2429; noted medicinal springs; Crescent College for Women.
**Euripides** (*yụ-rĭp'ĭ-dēz*) (480–406 B.C.), anc. Gk. tragic dramatist, **1536–7, 1032–3;** chief works, **1038.**
**Euro'pa,** in Gk. myth., daughter of a Phoenician king and sister of Cadmus; carried off to Crete by Zeus in form of a bull; **563.**
**Eur'ope,** by far the most densely populated of the continents; motherland of the modern world; 3,900,000 sq. mi.; pop. 470,000,000; **1187–1207,** *maps,* **1190–1, 1196–7,** *Study Outline,* **3899–3900;** animals, **1194;** art and antiquities ('In Mother Europe's Treasure House'), **1197–1207;** canals, **625–6;** climate, **1188, 1194, 794–5, 1549;** coastline and harbors, **1187, 1188, 1578–9, 33;** elevation, **226,** *map,* **1190–1,** *pictures,* **227, 2791;** fishing industry, **1190, 2528, 2194, 1283;** forests, **1327, 1328, 1194, 1441–2, 433;** former land connection with Africa, **3230, 3299,** ice

age, **1720–1**, **1466**; languages, **2770–2**, **1192**; minerals, **1192**, **814**, **1820**, **2755**, **647**, **664**, **3607**; mountains, **1190–3**; origin of name, **563**; population, **1194**, **2880–1**, *map*, **1190–1**; races, **2956**, **1192**, **1193**; railroads, **1194**; rainfall, **1194**, **2972–4**, *map*, **1190–1**; religions, **2994**; rivers and lakes, **1187–93**; vegetation, *map*, **1190–1**.

*History*, **1194–6**; chief events summarized, **1658–62**; *Study Outline*, **3955–69**; prehistoric period, **771–3**, **2956**, **666–8**, **3360–1**, **673–4**; beginning of European civilization, **27–9**, **1518**, **1520**, **3040–2**; Roman supremacy, **3046**, **1152**, **1352**, *map*, **3042**; Byzantine Empire, **551–2**; barbarian migrations, **1194–5**, **673–4**, **1491**, **73**, **1704**, **2047**, **3617–8**; Mohammedan invasion checked, **697**, **2278**; invasion of Northmen, **2525–8**, **2513**, **1195**; Charlemagne's empire, **688–90**; Holy Roman Empire, **1674–5**; feudal system, **1235–6**, **3249**; rise of cities, **769–70**; Crusades, **929–32**, **3624–5**, **551–2**; medieval commerce, **1219**, **1576**, **3317**, **3385**, **3624**; revolutionary inventions, **1801**, **773**, **1552**, **2916**; Renaissance, **2995–7**; Hundred Years' War, **1699–1701**; Black Death, **433**; fall of Constantinople and Turkish invasions, **871**, **3559**; period of exploration and discovery, **1416**, **2874**, **1638–9**, **1392–3**, **846–9**, **2115–6**; Portugal at height, **2888**; Hapsburg Empire at its height, **690–1**; Reformation, **2987–9**, **2084–5**; Thirty Years' War (1618–48), **3488–9**; wars of Louis XIV, **2065–6**, **2149–50**; Seven Years' War, **3180–1**; partition of Poland (1772–95), **2856**; Industrial Revolution, **1778**, **774**, **1218**, **3526**; French Revolution and Napoleon (1789–1815), **1366–70**, **2391–6**, **3699–3700**, **1196**; growth of political party system, **2869**; colonial expansion in 19th cent., **837**, **40**, **232**; revolutions of 1848, **1196**, **2067**, **2397**, **1448**, **1944–5**; unification of Italy, **1837–8**, **670**, **3638**; formation of Ger. Empire, **1448–9**, **427–8**, **2929**; Hague Peace Conference, **1559**, **1196**; Morocco incidents, **2327**, **1196**; Balkan Wars and "Eastern Question," **309–10**, **3559–60**, **1196**; World War, **3789–3812**, **1196**; League of Nations formed, **1974**. *See also in Index* chief topics above and separate countries by name.

**European** or **Caucasian race**, **2956–7**, **2881**, **664**; Polynesians, **2620**.

**European robin**, **3028**.

**Euro'pium**, a metallic chemical element, **4042**.

**Eurus** (*yu'rŭs*), in Gk. myth., the east wind, **29**.

**Eurydice** (*yu-rĭd'ĭ-sē*), in Gk. myth., wife of Orpheus; killed by serpent's bite, rescued from the underworld by Orpheus, but lost again; **2602**; subject of first opera, **2584**.

**Euryl'ochus**, in Gk. myth., companion of Odysseus (Ulysses), **768**.

**Eurystheus** (*yu-rĭs'thūs*), in Gk. myth., cousin of Hercules, **1640**.

**Eusden** (*yus'dĕn*), **Laurence** (1688–1730), Eng. poet remembered more for Pope's satirical allusions to him than for his poems; poet laureate, **2848**.

**Eusebius** (*yu-sē'bi-ŭs*) **of Caesarea**, called Pamphili (260?–340?). Christian theologian, most learned man of his age; 'History of the Christian Church', by far the most important anc. record of the church; called "father of church history"; chief figure at Council of Nicaea.

**Eusebius of Nicomedia**, called "the Great" (d. 341? A.D.). Theologian, leading defender of Arius, and after death of Arius leader of his party; a politician rather than a theologian; bishop of Nicomedia and Constantinople.

**Eusta'chian tube** of ear, **1056–7**, **121**.

**Eustachius** (*yu-stā'kĭ-ŭs*), **Bartolommeo** (1500?–74). Ital. anatomist, physician to Pope Sixtus V; investigated structure of kidneys, teeth, muscles of head and neck, and other parts of body.

**Eutaw** (*yu'tą*) **Springs**. Battle in Rev. War, 1781, led British to abandon S. Carolina; near Santee R., 60 mi. n.w. of Charleston; Americans led by Greene and Marion, British by Gen. Stuart.

**Euterpe** (*yu-tĕr'pē*), in Gk. myth., muse of lyric poetry, **2373**, *picture*, **156**.

**Euxine** (*yuks'in*) **Sea**. Anc. name for Black Sea.

**Eva**. In H. B. Stowe's 'Uncle Tom's Cabin', beautiful, affectionate, and supernaturally good child, daughter of Uncle Tom's master, who, like Dickens' "Little Nell," dies young.

**Evangeline**, heroine of Longfellow's poem of that name; separated from her lover at expulsion of Fr. Acadians (1755) from Nova Scotia by the English, she spends her life seeking him, and after many years finds him at the point of death; **4**; scene of story, **2538**; statue, *picture*, **617**.

**Evans, Mary Ann**. *See in Index* **Eliot, George**.

**Evans, Robley D.** (1846–1912). Amer. rear-admiral, called "Fighting Bob"; took important part in destruction of Cervera's fleet at Santiago in Span.-Amer. War; commanded Atlantic fleet 1905–07 and took it around world in 1907.

**Evanston**, Ill. Residential suburb of Chicago; pop. 37,234; Northwestern Univ.; headquarters National W.C.T.U.

**Evansville**, Ind. Shipping point on Ohio R. in s.w. corner; pop. 85,264; large trade in coal, farm products, and timber; extensive mfrs. of furniture, cigars, brooms, plows, engines, trucks; **1760**.

**Evapora'tion**, **1207**; fog, **1316**; Great Salt Lake, **1515**; in heating plants, **1622**; Mediterranean, **2194**; in plants, **3532**, **1186**, **1980**, **1000**; rainfall dependent on, **2972**; refrigeration, **2990**; in salt manufacture, *picture*, **3117**; from sea, **2559**; in partial vacuum, **3614**.

**Ev'arts, William M.** (1818–1901). Amer. lawyer and statesman; chief counsel for Pres. Johnson in impeachment trial; U.S. atty.-gen. 1868–69; sec. of state under Hayes; U.S. senator from N.Y. 1885–91; counsel for U.S. in *Alabama* arbitration; noted orator.

**Eve**, in the Creation story of Genesis, first woman, formed out of Adam's rib, ancestress of human race; in Milton's 'Paradise Lost', **2245–6**.

**'Evelina'**. Fanny Burney's first and best novel; told in form of letters; early example (1778) of novel of domestic manners.

**Evelyn** (*ēv'lĭn*), **Sir John** (1620–1706), Eng. diarist of the Commonwealth and Restoration, **1165**; estate of, *picture*, **2746**.

**Evening grosbeak**, **1542**.

**Evening primrose**, a flowering plant, **2417**, **1381**.

**Evening star**. Usually Venus, first planet visible after sunset; occasionally Mars, Jupiter, or Saturn.

**'Eve of Saint Agnes, The'**, poem by Keats, **1914**.

**Ev'erest, Sir George** (1790–1866), Eng. surveyor and geographer; superintended first survey of India 1823–43; located Mt. Everest, **1208**.

**Everest, Mt.**, in Himalaya Mts. (29,002 ft.); loftiest mountain on earth; **1207–8**, **3495**, *picture*, **227**, *map*, **1744**.

**Everett, Edward** (1794–1865), Amer. statesman and, during the decade preceding his death, the foremost Amer. orator; Unitarian minister at 20; professor of Greek at Harvard at 21; member of the House of Representatives 1825–35; gov. of Mass. 1836–40; minister to England 1841–45; pres. of Harvard 1846–49; sec. of state 1852–53; U.S. senator 1853–54; a classic example of "the scholar in politics"; at Gettysburg, **2014**.

**Everett**, Mass., mfg. city 3 mi. n. of Boston; pop. 40,120; chemicals, iron and steel products, shoes, coal-tar products, leather; gas and coke works; **472**.

**Everett**, Wash. Port on Puget Sound 25 mi. n. of Seattle in rich agricultural, timber, and mining district; pop. 27,644; lumber and flour mills, shipyards, rubber mfg.

**Everglades**, a swampy tract in s. Florida, **1298–1300**, **1208**, *picture-map*, **1297**.

**Everglade State**, **3347**.

**Evergreen**, **1208**, **3539**; how it guards against overloads of snow, **2829**; cedar, **670–1**; cypress, **946**; fir, **1248**; hemlock, **1629–30**; juniper, **1902–3**; laurel, **1970**; pine, **2807–9**; spruce, **3332–3**; yew, **3830**.

**Evergreen State**, **3686**.

**Everlasting** or **Perpetual League**, foundation of Swiss independence, **3415**, **3464**.

**"Ever victorious army,"** **1489**.

**"Every inch a king,"** **1926**.

**'Everyman'**, Eng. morality play, **2259**, **1034**.

**Evesham** (*ēv'shăm*), England. Market town in Worcestershire on Avon R. in vale of Evesham; pop. 10,000; site of battle of Evesham.

**Evesham, battle of**, ended Barons' War, **2317**, **1634**, **1087**.

**"Evil eye,"** belief in, **2120**.

**Evolution**, **1208–11**, **3937**; ancestral relationships of animals, **128–30**, **1336**, **1277**, **2997**, **3634**; ancestry rehearsed by embryos and young, **1209**, **1140–1**, **3634**, **1290**, **1373–4**; of birds from reptiles, **400–1**, **1229**, **2997**, **2038**, **128–30**, *pictures*, **401**, **409**; Darwin and Darwinism, **963–5**, **1208**, **1210**, **398**, **3841**; of earth, **2818–9**, **1058–60**, **1417–22**, **2787–92**, **3395**; effect of doctrine upon biology, **398**, upon zoölogy, **3841**; elephant trunks and tusks, *picture*, **1126**; evidence supporting theory, **1209–10**, **1334**, **1336**, **1141**; extinct monster animals, **132–8**; of flatfish, **1289–90**; fish, **1277**, **130**; foot, **1322–4**, **409**, **1683**, *picture*, **1682**; fossils as evidence, **1209**, **1334**, **1336**, *pictures*, **1682**, **1126**; of higher plants from algae, **90–2**; horse, **1683**, **1209**, *picture*, **1682**; Huxley, **1705–6**; Lamarckian view, **1210**; of mammals, **2997**, **1277**, **1908**, *diagram*, **128**; "mutation" theory, **1210–1**, "natural selection," **1210**; nest-building instinct in birds, **405–6**; origin of life on earth, **1209**, **1062**; of penguin, **2716**; planets, **2818–9**; relation between man and apes, **154**; of reptiles, **2997**, **2038**; "reversion to type," **1483**, **1277**, **2804**; "struggle for existence," **127**, **2820**, **2827**, **1781–2**; "survival of the fittest," **1210**, **127**; theory established in geology, **964**; theory foreseen by Goethe, **1478**; "transitional" forms of life, **1047**; Wallace's theory, **964**; Weismann's theory, **1210**; of whales, **3723**, **1209**. *See also in Index* **Adaptation**; **Environment**; **Heredity**; etc.

**Ewald** (*ā'vält*), **Johannes** (1743–81). Denmark's greatest lyric poet, first used in imaginative writing the anc. history and mythology of Scandinavia; found Danish literature rhetorical and lacking in vigor, gave it vivacity of style

and freshness of form; 'Rolf Krage', first original Danish tragedy; 'Balder's Death', a heroic opera; 'The Fishers', which contains the Danish national song, a lyrical drama.

**Ewe** (*yu̧*), a female sheep, **3198.**

**Ew'ell, Richard Stoddert** (1817–72). Confederate general, second in command to "Stonewall" Jackson in the Shenandoah Valley campaign, and after Jackson's death promoted to lieut.-gen. and to command 2d Corps; lost leg at 2d battle of Bull Run; led advance of Lee's army into Pa.; fought desperately at Gettysburg; with Lee through the Wilderness and Petersburg campaigns.

**Ew'ing, Juliana Horatia Orr** (1841–85). Eng. writer of books for children; simple in style, wholesome quiet humor; 'The Story of a Short Life' and 'Jackanapes' are most popular. Many of her books are illustrated by Kate Greenaway and Randolph Caldecott.

**Ewing, Thomas** (1789–1871). Amer. lawyer and statesman, several times U.S. senator from Ohio, sec. of treasury under W. H. Harrison; first sec. of interior 1849–50; strenuously opposed Compromise of 1850; Gen. William T. Sherman was his son-in-law.

**Exarchate** (*ĕks'ür-kāt*) **of Ravenna, 2979.**

**Excalibur** (*ĕks-kăl'ĭ-bŭr*) **or Escalibur,** King Arthur's sword, **3422;** story of, **223–4.** According to another account (Tennyson's 'Idylls of the King') it was given to him by the Lady of the Lake.

**Excelsior Springs,** Mo., town and watering place 25 mi. n.e. of Kansas City; pop. 4165; **2269.**

**Exchange, bank,** on checks, **327–8.**

**Exchange, foreign.** *See in Index* **Foreign exchange.**

**Exchange, produce,** or Board of Trade, **440–1.**

**Exchange, stock, 3359–60.**

**Exchange, telephone.** *See in Index* **Telephone.**

**Exchequer** (*ĕks-chĕk'ĕr*), **Chancellor of the.** In Gt. Brit. the actual head of the Treasury and the official charged with the preparation of the budget; he must be a member of the House of Commons and holds a portfolio in the Cabinet.

**Exchequer, Court of,** a division of the Eng. High Court of Justice, **909.**

**Excise** (*ĕk-sīz'*), or internal revenue tax, **3441;** defined by Dr. Johnson, **1898.**

**Exclamation point,** use of, **2936.**

**Excommunica'tion,** church, **764, 1780.**

**Execu'tion,** methods of, **2918–9.**

**Exec'utive,** state, **3346.**

**Executive departments,** in U.S. govt., **3596–3601; table of organization, 3597.**

**Executive Mansion.** *See in Index* **White House.**

**Exercise,** physical, **2784–5;** athletics, **251–2;** effect on health, **1713;** setting up exercises, *pictures,* **2785.** *See also in Index* **Games.**

**Ex'eter,** England. Old town on R. Exe, 10 mi. from English Channel; pop. 61,000; 12th cent. cathedral; Exeter College; various mfrs.; once center of Brit. resistance to Anglo-Saxon invaders.

**Exeter,** N.H., mfg. town 25 mi. e. of Manchester; pop. 4604; founded 1638; seat of state govt. during Revolution; Philips Exeter Academy, **2456.**

**Exeter College,** Oxford, **2610.**

**Ex'ocarp,** fleshy portion of a pitted fruit, **1380.**

**Ex'odus** (Greek, "going forth" or "departure"), 2d book of the Old Testament and Pentateuch; describes the giving of the divine law; opens with the account of Moses leading Israelites out of Egypt; **2333.**

**Experiment,** as a scientific method, foreshadowed by Roger Bacon, **301, 2787,** *picture,* **712;** developed by Francis Bacon, **301;** in chemistry, **710–5;** in plant breeding by Burbank, **538–9;** in conquest of yellow fever, **2336.**

**Exploits River,** Newfoundland. Flows into bay on n.e. coast; 150 mi. long.

**Explorers and explorations, 1416;** Balboa discovers the Pacific, **305–6;** Cabots reach coast of N. Amer., **561–2;** Columbus discovers New World, **846–9;** commercial motives, **3317, 853, 2723, 1479;** Da Gama reaches India, **1392–3;** Drake circumnavigates globe, **1030–1,** *map,* **2115;** Henry the Navigator, **1638–9;** Henry Hudson, **1690;** Magellan circumnavigates the world, **2116,** *map,* **2115;** Marco Polo reaches China, **2874;** discoveries of the Northmen, **2525, 2526–7;** Pacific discoveries, **2623, 872, 874;** polar. **2859–64, 2703–4, 119–21, 3149–50,** *maps,* **189, 120;** voyages to Western Hemisphere, *map,* **110.**

**Explosion, 1211;** "dust," **1212;** in gas engines, **1404, 281, 1250;** of gases, **1250.**

**Explosives, 1211–12;** amount used in mining, *picture,* **2251;** ammonal, **105;** blasting gelatine, **833;** Du Pont mills, **3743;** in fireworks, **1264–6;** gunpowder, **1552–3;** liquid air, **2025;** nitroglycerin and dynamite, **1050;** picric acid, **814, 641;** silver fulminate, **3242;** "T N T," **814;** used in quarrying, **2944;** why nitrogen is needed, **2511, 1211.**

**Expo'nent,** in algebra, **95.**

**Exports and imports,** U.S., **3591.**

**Exposi'tions, international,** or world's fairs, **1220.**

**Ex post facto law** (Latin, "from what is done afterward"). Law passed after an offense or crime and providing penalty for it; U.S. Constitution (Art. 1, Sec. 9) forbids such laws.

**Express companies,** organized to provide safer and more rapid delivery of packages than can be given by regular freight service; companies now combine shipment of packages with transfer of money, securities, and other valuables; forwarding exports and imports; issue of money orders, letters of credit, and money transfers by telegraph; first company began to operate in United States 1838; **2971, 1794.**

**Extension departments,** of colleges, **831.**

**Extradition,** U.S. law, **3346.**

**Extra-territorial** rights, the privilege accorded by international law to foreign sovereigns and diplomatic representatives of freedom from compliance with the laws of the country in which they are stopping, **1013.** By special treaty citizens of U.S. and European powers have at times had similar rights in African and Asiatic countries; in China, **746.**

**Extreme unction,** sacrament, **764.**

**Eye, 1213–16,** *pictures,* **1988, 2796;** of beetle, **371,** *picture,* **1215;** bird, **1213, 401;** cat, **1213, 657,** *picture,* **1215;** chameleon, **685,** *picture,* **1215;** color blindness, **1216;** of crawfish, **915,** *picture,* **915;** cuttlefish, **941,** *picture,* **942;** defects of vision, **1214, 1216, 3310;** dislodging foreign body, **1270;** of dragon-fly, **1213, 1028;** drone bee, **362;** eagle, **1213,** *pictures,* **1215, 1053;** fish, **1274;** flatfish, **1290;** insects, **1787;** nautilus, **2418;** persistence of vision, **2352;** of snail, **3256;** snakes lack eyelids, **3257;** spectacles, **3310, 1714–5;** of spider, **3326;** squid, *picture,* **941;** whirligigs, **371.**

**Eye-glasses,** or spectacles, **3310, 1714–5.**

**Eyepiece,** of telescope, **3462, 3463.**

**Eye splice,** of a rope, **1940–1.**

**Eye tooth,** of man, **3452;** elephants' tusks, **1126.**

**Eyre** (*êr*), **Edward John** (1815–1901), Eng. colonial gov., explored shores of Great Australian Bight for 1200 mi., in 1840–41; later gov. of Jamaica; **267.**

**Ezekiel** (*ĕ-zē'kĭ-ĕl*) (Hebrew, "God will strengthen"), one of the major Hebrew prophets (author of 26th book of Old Testament), who was carried prisoner to Babylonia in 597 B.C. and flourished about 592–570 B.C., **2922.**

**Ez'ra,** "the Scribe," Hebrew priest and reformer (books of Ezra and Nehemiah); sent to Palestine in 458 B.C. by Artaxerxes to investigate condition of Jews; brought back observance of Mosaic law; **1891.**

# F

THE letter F looks so much like E that some have thought it developed from the same form, but such is not the case. It has its own interesting story to tell. Long ago it was the Egyptian cerastes  or horned asp. The two bars are survivals of the two horns of  this poisonous viper, while the vertical stroke represents the body. Written in a running hand it became  and then the Phoenician  which they called *Wau* or *Vau*, meaning a "hook" or "peg." The Greeks wrote it much like our Y and called it *Digamma* from its fancied resemblance to two united gammas or G's, one above the other. We fail to find it in the modern Greek alphabet, for after a time it dropped out of general use. The western Greeks continued to use it for some time, however, and the Romans adopted it from them, giving it the form which we now use, as well as its sound "ef." Its original sound, as you might guess from its Phoenician name, was that of our *w* or *v*. And it was sounded as *w* even by the Greeks. The *f* sound in English is often represented by the digraph *ph*, as in "philosophy." This *ph* represents the Greek letter *Phi* **Φ** which, we are told, was originally pronounced *p-h*, like the final sound of "lip" in English, but in time came to be equivalent to Latin *f*.

**Fabaceae** (*fȧ-bā'sĕ-ē*), or *Leguminosae*, the bean family, **349, 810, 2698, 3941.**

**"Fabian** (*fā'bĭ-ăn*) **policy," 1575.**

**Fa'bius** (Quintus Fabius Maximus) (d. 203 B.C.), Rom. general, **1575.**

**Fables, Aesop's, 30.**

**Fabliaux** (*fȧ-blyō'*), medieval Fr. verse tales, **2539.**

**Fabre** (*fä'br*), **Jean-Henri** (1823–1915), Fr. entomologist and author, **1217–8, 2410.**

**Fabrics.** *See in Index* **Cloth.**

**Facial angle, 2956.**

**Factor,** in mathematics, one of the numbers whose product is a given number; factoring in algebra, **96;** in fractions, **1341.**

**"Factories,"** or trading posts of Hanseatic League, **1576.**

**Factories and factory laws, 1218–9, 210, 1778;** child labor laws, **728–9;** clothing industry, **806;** health inspection, **1614;** in Japan, **1867;** labor organizations, **1947;** shoe industry, **3221;** sweatshops, **3400.**

**Faenza** (*fä-ĕn'dzä*), Italy, city 19 mi. s.w. of Ravenna; pop. of commune, 40,000; 15th cent. cathedral; noted for pottery, **2906.**

**'Faerie Queene',** allegorical romance by Edmund Spenser, **1164.**

**Faeroe Islands.** Same as **Faroe Islands.**

**Fafnir** (*fäv'nēr*), in Norse myth., a dragon; guardian of the treasure later known as the Nibelung hoard; **3231.**

**Fagaceae** (*fȧ-gā'sĕ-ē*), the beech family, **3940;** includes beeches, **364–5;** chestnuts, **718–9;** oaks, **2547–8.**

**Fa'gin.** A crafty old Jew, thief-trainer, and receiver of stolen goods in Dickens' 'Oliver Twist'.

**Faguet** (*fä-gā'*), **Emile** (1847–1916). Fr. critic and man of letters; elected to Academy 1901; professor of poetry at Sorbonne.

**Fahrenheit** (*fä'rĕn-hīt*), **Gabriel D.,** Ger. physicist and instrument maker; devised Fahrenheit scale for thermometers, **3487.**

**Fahrenheit thermometer, 3487,** *picture,* **3486.**

**Faience** (*fä-yäns'*), a variety of pottery, **2906.**

**Fainting, 438;** treatment, **1270.**

**Fairbairn** (*fêr'bêrn*), **Sir William** (1789–1874). Scotch engineer and inventor; a pioneer builder of iron ships in Gt. Brit.; with Robert Stephenson, built tubular bridge over Menai Strait.

**Fairbanks, Charles Warren** (1852–1918), Amer. politician; U.S. senator from Indiana 1897–1905; vice-president, **3060, 3636.**

**Fairbanks, Thaddeus** (1796–1886). Inventor of the compound-lever platform scales, and founder, with his brother Erastus (1792–1864) of the firm of E. & T. Fairbanks & Co.; b. Brimfield, Mass.

**Fairbanks,** Alaska, on Tanana R., largest gold-mining town in interior; pop. 1155; **79.**

**Fairfax, Thomas, Baron** (1612–71). Eng. Parliamentary general; under Cromwell, victor at Naseby.

**Fairfax, Thomas, Baron** (1692–1782), Amer. colonist, b. England; owner of the "Northern Neck" and Shenandoah Valley of Va. (nearly one-fourth of the present state); George Washington, **3675;** bequest to Va., **3720.**

**Fairfield,** Conn., summer resort and mfg. town on Long Island Sound, 51 mi. n.e. of New York City; pop. 11,475; Indian and Rev. War battles; burned by Hessians and Tories in 1779; bird reserve, **426.**

**Fairies, 1219, 1318, 2118;** in 'Midsummer Night's Dream', **2230.** —*Stories:* 'Peter Pan', **335–7,** 'The Fairy Calf of Tipperary', **1812–4.**

**Fairmont,** W. Va. City 55 mi. s.e. of Wheeling; pop. 17,851; coal mining, oil, natural gas; glass mfrs.; state miners' hospital.

**Fairmount College.** At Wichita, Kan.; co-ed., Cong.; opened 1892 (organized as college 1895); liberal arts, music.

**Fair Oaks, battle of.** A bloody engagement fought 7 mi. s.e. of Richmond, Va., May 31–June 1, 1862, between Union forces under McClellan and Confederates under J. E. Johnston; also called battle of Seven Pines.

**Fairport Harbor,** Ohio, village on L. Erie; pop. 4211; **2570.**

**Fairs and markets, 1219–20;** Leipzig, **1985;** Russia, **3088.**

**Fairy-fly, 131.**

**Fairy rings, 2374.**

**Fairy tales,** compared with myths, **2385;** Hans Christian Andersen, **121–2;** list of books, **2029.** *See also in Index* **Fairies.**

**Faisal** or **Feisal** (born 1885). Arab Emir, son of Husein, Arab king of Hejaz; active in Young Turk movement; leader in Arab revolt (1916) and commander of n. Arabian forces in World War; represented Arabia at Peace Conference; crowned King of Iraq 1921.

**'Faith',** a Little Talk by Arthur Mee, **1221–2,** *picture,* frontispiece, Vol. 3.

**Fakirs** (*fä-kērz'* or *fā'kērz*), in India, **525, 381, 1718,** *picture,* **1750.**

**Falaise** (*fä-lāz'*). A town in n.w. France; ruined castle, birthplace of William the Conqueror.

**Falconry** (*fą'kn-rĭ*), **1220, 1606, 1935.**

**Falcons, 1606, 1220.**

**Faliero** (*fä-lē-ā'rō*) or **Falier Marino** (1279?–1355). Doge of Venice (1354–55), conspired to make himself sovereign; executed; subject of dramas by Byron, Swinburne, and others.

**Falkenhayn, Erich von** (1861–1922). Ger. general; served in China 1900–03; Prussian minister of war 1913; succeeded von Moltke 1914 as chief of general staff of Ger. army; failure of attacks on Verdun caused his retirement in favor of von Hindenburg; served remainder of World War in Rumania and in Caucasus.

**Falkirk** (*fąl'kĕrk*), Scotland, town 17 mi. e. of Glasgow; pop. 35,000; iron-casting, cattle market; here Wallace was defeated 1298 by Edward I, **3667, 3148.** Second battle of Falkirk, 1746, Highlanders under Prince Charles defeated England under Gen. Hawley.

**Falkland Islands,** in S. Atlantic Ocean; pop. 3000; Brit. colony; **1223, 3285, 513,** *map,* **3288–9;** naval battle, in World War, **3796, 1223;** sea-elephants, **3169.**

**Falköping** (*fäl'chē-pĭng*). Small town in s. Sweden; victory (1389) of Margaret, queen of Denmark and Norway, over king of Sweden, resulting in union of the 3 kingdoms.

**Fall, Albert Bacon** (born 1861). Amer. legislator, b. Frankfort, Ky.; senator from N.M. (1913–21), sec. of interior under President Harding.

**Fallen Timbers, battle of,** on Maumee R., 15 mi. from Toledo, Ohio; Indians defeated by Anthony Wayne (1794), leading to Treaty of Greenville; **3707, 1593.**

**Fallersleben, Hoffmann von.** *See in Index* **Hoffman, A. H.**

**Fallières** (*fäl-yêr'*), **Armand** (born 1841). Fr. statesman, pres. of Fr. Republic (1906–13).

**Falling bodies, law of, 1508, 2190;** Galileo's experiment, **1391, 1392,** *picture,* **1509.**

**Fall line,** in physiography, defined, **3878, 3879;** in Ga., **1431;** in N.C., **2518;** in S.C., **3290.**

**Fall River,** Mass., greatest textile center in Amer.; 49 mi. s. of Boston; pop. 120,485; **1223, 2166.**

**Falls of St. Anthony,** in Mississippi R., **2265;** discovered by Hennepin, **1632;** water-power, **2252.**
**Falmouth** (*făl'mŭth*), England. Seaport and winter resort in Cornwall at mouth of Fal R.; pop. 13,000; Pendennis and St. Mawes castles.
**False acacia,** a tree. Same as **Locust.**
**False Demetrius.** *See in Index* **Demetrius.**
**Falstaff** (*fąl'stăf*), **Sir John,** genial, dissolute "fat knight," boon companion of wild Prince Hal in Shakespeare's 'Henry IV' (I and II) and comic butt in the 'Merry Wives of Windsor', **3190, 1164.**
**'Falstaff',** opera by Verdi, **3628.**
**Fal'ster,** Danish isl. 30 mi. long, renowned for its orchards, **996,** *map,* **997.**
**Fame, Hall of, 1566.**
**Family, 1223–4.**
**Family,** in animal classification, **412.**
**Family Compact,** a political clique in Canada, **2102.**
**Family names,** origin of, **2388.**
**Famines,** in Hebrides, **1625;** in India, **1747;** Ireland, **2706, 1810;** in Russia, **3087–8.**
**Fan blower,** *picture,* **1623,** in mines, **2250.**
**Fan coral, 884,** *picture,* **885.**
**Faneuil** (*făn'l*), **Peter** (1700–43). Boston (Mass.) merchant of Fr. Huguenot descent, b. New Rochelle, N.Y.; built and gave to Boston as a market and public meeting-place Faneuil Hall, called the "Cradle of Liberty" because Revolutionary patriots met there.
**Faneuil Hall, 472,** *picture,* **471.**
**Fang,** snake's, **3646–7, 2978, 3261;** spider's, *picture,* **3323.**
**Fanning Island,** one of a group of coral islands in Pacific near equator; cable station, **561.**
**Fan palm, 2647.**
**Fantail pigeons, 2804.**
**Fantine** (*făn-tēn'*), in Hugo's 'Les Miserables', mother of Cosette, befriended by Jean Valjean, **1696.**
**Fan vaulting,** in architecture, **188;** of Westminster Abbey, **2054.**
**Faraday** (*făr'ą-dā*), **Michael** (1791–1867), Eng. chemist and physicist, **1224,** *pictures,* **1121, 1119;** Davy's tribute, **969, 1799;** discovers electromagnetic induction, **1121, 1050;** foresaw radioactivity, **3824;** influence on Tyndall, **3572;** skeptical concerning electric light, **1797.**
**Far East.** Term applied to countries of e. Asia—China, Japan, Korea, Siberia, etc.
**Far Eastern Democratic Republic,** formed in Siberia following World War, **3229.**
**Farel** (*fă-rĕl'*), **Guillaume** (1489–1565), Fr. reformer and preacher in Switzerland; and Calvin, **587.**
**Fare register** (street car), **572.**
**Farewell Address,** Washington's, **3678.**
**Fargo** (*fär'gō*), N.D., largest city in state, near e. border on Red R.; r.r. center in agricultural region; pop. 21,961; important distributing point for heavy farm machinery; N.D. Agricultural and Fargo Colleges; **2525.**
**Fargo College.** At Fargo, N.D.; co-ed.; founded 1887 by Congregationalists but now non-sectarian; liberal arts, music, art.
**Faribault** (*făr'ĭ-bō*), Minn. Mfg. city and educational center 52 mi. s. of St. Paul; pop. 11,089; pianos, condensed milk, carriages, furniture, shoes, flour, lumber.
**Farman biplane,** *picture,* **57.**
**Farmers,** number in U.S., **3586.**
**Farmers' coöperative societies, 879.**
**Farmers of taxes,** in anc. Rome, **3044.**
**Farming, 43–9.** *See also in Index* **Agriculture.**
**Farmington River,** a stream in n. cent. Connecticut flowing about 100 mi. to the Connecticut R.; *map,* **864.**
**Farm lands,** in U.S., **3588.**
**Farm Loan Board** (U.S.), **1224, 3746.**
**Farm machinery.** *See in Index* **Agricultural implements.**
**Farm Management, Office of,** branch of Dept. of Agriculture, **3600.**
**Farms,** average size in U.S. and France, **1347.**
**Farnese** (*fär-nā'sā*), great Ital. family, including one pope, Paul III, a great general, Alessandro Farnese (1547–92), and the dukes and princes of Parma (1545–1731). The Farnese name is connected with several works of anc. art, formerly owned by the family; palace at Rome, **3057.**
**'Farnese Hercules',** statue, **1641.**
**Faroe** (*fā'rō*) **Islands** ("Sheep Islands"), group of Danish isls., between the Shetland Isls. and Iceland; 540 sq. mi.; pop. 20,000; fishing, sheep-raising; **997.**
**Farquhar** (*făr'kwär*), **George** (1677?–1707), Eng. comic dramatist ('The Beaux' Stratagem'), **1036.**
**Far'ragut, David Glasgow** (1801–70), U.S. naval officer, **1224–5, 2274;** sailor's "dicky" a tribute, **2426;** statue by Saint-Gaudens, **3107.**
**Farrar** (*făr'ăr*), **Geraldine** (born 1882). Amer. grand opera singer, b. Melrose, Mass. ('Madame Butterfly', Marguerite in 'Faust').
**Farrell,** Pa. (formerly S. Sharon). City s. of Sharon, near center of w. boundary; pop. 15,586; steel, iron, tin plate, brass, explosives; coal mining and stone quarrying.
**Far-sightedness** (hypermetropia), **1214, 3310.**
**Farther India,** or Indo-China, **1777.**
**Farthing.** An Eng. coin, worth about ½ cent in U.S. money.
**Far'thingale,** or hoop skirt, **900.**
**Fas'cicled roots, 3063.**
**Fascis'ti.** An organization of World War veterans in Italy formed in 1919 to oppose spread of communism; gained control of govt. 1922, their chief, Benito Mussolini, becoming premier.
**Fashoda** (*fą-shō'dä*). Town in Anglo-Egyptian Sudan, on upper Nile; occupation by French 1898 angered British; adjustment led to mutual support of the two countries in African affairs; renamed Kodok 1904.
**Fata Morgana** (*fä'tą môr-gä'nä*), a mirage, **2261.**
**Fates,** in Gk. myth., **1225.**
**"Father Abraham."** Lincoln.
**Father of Algebra.** Diophantus.
**Father of Angling.** Izaak Walton.
**Father of Church History.** Eusebius of Caesarea.
**Father of Comedy.** Aristophanes.
**Father of English Poetry.** Chaucer.
**Father of Epic Poetry.** Homer.
**Father of Geometry.** Euclid.
**Father of His Country.** Washington.
**Father of History.** Herodotus.
**Father of Italian Prose.** Boccaccio.
**Father of Lies.** Satan.
**Father of Medicine.** Hippocrates.
**Father of Music.** Palestrina.
**Father of Russian Literature.** Lomonosof.
**Father of the Constitution.** Madison.
**Father of the English Navy.** Alfred the Great.
**Father of the Faithful.** Abraham.
**Father of Tragedy.** Aeschylus.
**Father of Waters.** The Mississippi.
**Fathers of the Church, 764.**
**Fath'om,** a unit of measure, **3715.**
**Fatima** (*fä'tē-mä*) (606?–632), favorite daughter of Mohammed, wife of Ali, and ancestress of the Fatimite califs, **2278;** burial place, *picture,* **955.**
**Fatimite dynasty,** Arabian califs who ruled Egypt, Syria, and N. Africa 908–1171; claimed descent from Fatima; **566, 2278.**
**Fats, 1225–7;** blubber, **3724;** in butter, *picture,* **544;** as food, **1320, 1321, 1322;** how digested, **1011;** in oleomargarine, **2577–9;** in soap-making, **3263, 3267.** *See also in Index* **Oils.**
**Fat-soluble vitamins, 3651–2.**
**Fat-tailed sheep, 3200.**
**Fatty acids,** organic acids derived from "open chain" hydrocarbons; combined with glycerin in fats and oils, **1476, 1227;** in soap-making, **1476, 3263, 10.**
**Faubourg** (*fō-bur'*), defined, **2684.**
**Fault,** in geology, **2358;** picture, **1419;** causes earthquakes, **1064.**
**"Faultless painter," 2630.**
**Faun,** in Rom. myth., goatlike creature corresponding to Gk. satyr, **2648, 1012;** of Praxiteles ('The Marble Faun'), **1530.**
**Fau'na,** all the animals of a region or division of geologic time. *See in Index* **Animals;** for the fauna of a region *see* the region by name.
**Faunus** (*fą'nŭs*), in Rom. myth., rural god identified with the Gk. Pan, **2648.**
**Faure** (*fōr*), **Félix** (1841–99). Fr. statesman, pres. of Fr. Republic 1895–99.
**Faust** (*foust*), **Johann,** printer. Same as **Fust.**
**'Faust',** dramatic poem by Goethe, **1477–8, 1228.**
**'Faust',** opera by Gounod, **1228.**
**Faust legends, 1227–8.**
**Fawcett** (*fą'sĕt*), **Henry (1833–84).** Blind Eng. statesman, reformer, economist, member of parliament, and postmaster-general; inaugurated parcel post and postal savings bank and insurance.
**Fawkes** (*fąks*), **Guy** (1570–1606), leader in Gunpowder Plot, **1228, 1860.**
**Fawn,** young of Virginia deer and allies, **979.**
**Fayal** (*fī-äl'*). One of the Azores Isls.; 65 sq. mi.; pop. 25,000; chief town, Horta, has best anchorage in the Azores.
**Fayette** (*fā-ĕt'*), Mo. Agricultural trade center 100 mi. e. of Kansas City; pop. 2381; Howard Payne College, Central College.
**Fayette,** N.Y., town 7½ mi. s. of Waterloo, near Cayuga L.; pop. 2215 (including part of Waterloo village); Mormon church organized, **2326.**
**Fayetteville,** Ark., city in Ozark Mts.; pop. 5362; summer resort; trade in fruit, live stock, grain; U. of Arkansas; **207.**
**Fayolle** (*fā-yōl'*), **Marie-Emile** (born 1852). Fr. general, marshal of France; on retired list at beginning of World War; division and corps commander 1914–15; commanded Fr. forces in Somme offensive July–Nov. 1916; commanded central group of armies 1917, northern group 1918.
**Fayum** (*fī-ụm'*) or **Fayoum,** province of upper Egypt on w. side of Nile; 669 sq. mi.; pop. 508,000; noted for fertility; cap. Fayum (Medinet el Fayum), pop. 45,000; market for fruits, rice, cotton; **1093, 1097.**
**Fazen'da,** a coffee plantation, **822.**
**Fealty, oath of,** in feudal system, **1236.**
**Fear, Cape,** on s. coast of N.C., **2518.**
**Feather cloaks, 289, 1229,** *picture,* **2499.**
**Feathers, 1228–9, 400;** egret, **3365;** growth and molting, **409–12;** how

colored, **411–2, 1229;** in owls, **2606;** paradise birds, **2674, 2676;** peacock, **2699, 2700;** protective coloration, **2924,** *picture,* **2925.**
**Feather-wing beetles, 368.**
**Feb'ruary,** 2d month of calendar, **1229;** birthday stone, **1409.**
**Fechner** (*fĕĸ'nĕr*), **Gustav Theodor** (1801–87). Ger. philosopher and physicist, founder of modern psychology and psychophysics.
**'Federalist, The',** series of essays written by Hamilton and others in support of U.S. constitution, **1569, 112, 2107.**
**Federalists,** Amer. political party, **2870, 3604, 3677–8;** leaders, **13, 1569;** pass Alien and Sedition Laws, **14;** decline of influence, **14, 1882–3, 2107, 2108, 2306;** Burr in, **543;** oppose Louisiana Purchase, **2073;** oppose War of 1812, **2108, 3671, 3672–3;** oppose John Quincy Adams, **15.**
**Federal Land Banks, 328–9, 1224.**
**Federal plan** of municipal govt., **2370, 3511–2.**
**Federal Reserve Banks, 1230, 328.**
**Federal Reserve Districts,** *map,* **1230.**
**Federal Road Act, 3026.**
**Federal Trade Commission, 1230, 3546.**
**Federated Malay States, 2130,** *map,* **232–3;** tin, **3504.** *See also in Index* **Malay Peninsula.**
**Federation of Labor, American, 1947, 1487.**
**Feelers,** of animals. Same as **Antennae.**
**Fehmarn** (*fā'mērn*) or **Femern.** Isl. in Baltic Sea, part of Ger. province of Holstein; pop. 10,000; agriculture, stock-raising, fishing.
**Fehrbellin** (*fār-bĕ-lēn'*), Germany. Small town in Prussia 35 mi. n.w. of Berlin; defeat of Swedes under Wrangel by Frederick the Great Elector 1675.
**Feisal.** Same as **Faisal.**
**Feldberg** (*fĕlt'bĕrG*), highest point of Black Forest, **433.**
**Feld'spar** or **felspar, 1230;** in clay **784;** Conn., **866;** in granite, **1497;** used in porcelain, **2883.**
**Felidae** (*fē'lĭ-dē*), the cat family, **658, 3950;** includes cheetahs, **1989,** lynxes, **2087,** and members of genus *Felis.*
**Felis,** the cat genus; includes domestic cats, **658;** jaguars, **1859;** leopards, panthers, ocelots, **1988–9;** lions, **2025;** pumas, **2934;** tigers, **3499.**
**Fe'lix, Antonius.** Rom. procurator of Judea (52–60 A.D.), before whom the apostle Paul, arrested in Jerusalem, was sent to be judged.
**Fellahin** (*fĕl-ä-ēn'*), Egyptian peasants, **1096–7, 1092, 37.**
**Fellowships,** in colleges, **830–1.**
**Felspar.** Same as **Feldspar.**
**Felt,** a fabric, **1231;** how made, **804, 3782;** hats, **1597,** *picture,* **1599.**
**Femern Island.** Same as **Fehmarn.**
**Fencing,** a sport, **1231–2;** foil, *picture,* **3422.**
**Fénelon** (*fā-nē-lôn'*), **François de Salignac de la Mothe** (1651–1715), Fr. churchman and author, archbishop of Cambrai and tutor to Louis XIV's eldest grandson, the duke of Burgundy; wrote 'Télémaque', famous didactic tale, children's classic; **1365.**
**Fenians** (*fē'nĭ-ănz*), Irish revolutionary society which flourished about 1861–72; sought to end Eng. rule in Ireland; failure in direct results, but instrumental in convincing Gladstone and others of the need of ending such incitements to disaffection as the Irish Established (Protestant) church; name derived from the Fianna, legendary band of heroes surrounding Finn MacCool; support Parnell, **2689.**
**Fen'nel.** Herb of parsley family; small yellow flowers; seeds used for seasoning in many countries; leaves are used for flavoring; sweet fennel yields aromatic essential oil.
**Fen'rir** or **Fenris the Wolf.** In Scandinavian myth., monster, child of the evil god Loki; kept chained by magic till Ragnarök (Judgment Day), when he is destined to break loose, spread his jaws to heaven and earth, and, breathing fire, devour Odin.
**Fens, The,** marshy low-lying districts in e. England, in Lincoln, Huntingdon, Cambridge, and Norfolk counties; mostly reclaimed, very fertile; **1160.**
**Feodo'sia, Russia** (formerly Kaffa, Gk. Theodosia). Busy port and resort of s.e. Crimea; pop. 44,000; dist. famous for grapes; makes carpets, rugs, soap.
**Fer-de-lance** (*fĕr-dē-läns'*), a snake, **3259, 2156.**
**Fer'dinand I** (1793–1875), emperor of Austria; succeeded 1835; intermittently insane; informal regency headed by Metternich, governing in his name, provoked rebellion which led to his abdication (1848), **1354.**
**Ferdinand I** (born 1861), king of Bulgaria (1887–1918), "the old fox of the Balkans," a Ger. princeling, elected prince of Bulgaria in 1886; assumed title of king or czar 1908; part in World War, **533.**
**Ferdinand I** (d. 1065), "the Great," king of Castile and Leon, celebrated for victories over Mohammedans, **2890.**
**Ferdinand I** (1503–64), Holy Roman emperor; succeeded his brother Charles V (1558); **1195, 1703.**
**Ferdinand II** (1578–1637), Holy Roman emperor; succeeded 1619; and Thirty Years' War, **3488, 1554.**
**Ferdinand III** (1608–57), Holy Roman emperor, active in terminating Thirty Years' War; distinguished for intellectual attainments; **1117.**
**Ferdinand I** (1423–94). King of Naples; able but tyrannical, cruel, and treacherous.
**Ferdinand I** (born 1865). King of Rumania; succeeded his uncle Charles (1914).
**Ferdinand,** kings of Spain. For list *see in Index* **Spain:** *History.*
**Ferdinand II** (1452–1516) **of Aragon,** "the Catholic" (Ferdinand V of Castile and Leon); first ruler of united Spain and patron of Columbus; **3304, 1832;** expels Moors, **2323, 3541,** *picture,* **3301;** Inquisition under, **1780, 1832;** and Columbus, **1832, 848,** *picture,* **3301.**
**Ferdinand VII** (1784–1833). King of Spain; succeeded on abdication of father, Charles IV, in 1808; deposed by Napoleon same year; restored in 1814; vicious, cruel, incompetent ruler under whom Spain lost Amer. colonies on mainland.
**Ferdinand I** (1751–1825). King of the Two Sicilies; succeeded 1759; stupid, cruel, cowardly; twice dethroned as king of Naples; restored by foreign aid.
**Ferdinand II** (1810–59). King of the Two Sicilies; succeeded in 1830; cruel, treacherous tyrant; earned nickname "King Bomba" by bombarding rebellious cities.
**Ferghana** (*fĕr-gä'nȧ*), province in s.e. Rus. Turkestan; 55,483 sq. mi.; pop. 2,169,600; coal, lead, graphite, oil, raw cotton; largest city Khokand; cap. New Marghelan; Baber flees from, **3555.**
**Fer'guson, Sir Samuel** (1810–86), Irish poet and antiquary; pres. of Irish Academy 1882; his poetry deals with Gaelic myths and traditions; **1814.**
**Fermanagh** (*fĕr-măn'ä*). A county of Ulster, Ireland; 714 sq. mi.; pop. 62,000; county-town, Enniskillen; scene of much fighting 1921–22.
**Fermenta'tion, 1232;** alcoholic, **84;** cacao beans, **756;** caused by yeasts, **3828, 2825, 302;** cream of tartar, **1502, 3438;** Pasteur's discoveries, **2692, 150, 302;** tea, **3450;** tobacco, **3510;** vinegar, **3644.**
**Fermoy** (*fĕr-mōy'*), Ireland. Garrison town 18 mi. n.e. of Cork; pop. 11,000; market for agricultural produce and flour; Sept. 7, 1919 scene of first Brit. reprisals.
**Fernando Po** (*fĕr-năn'dō pō*), Span. isl. in Bight of Biafra off w. coast of Africa; 780 sq. mi.; pop. 25,000; mountainous; timber, sugar, coffee, tobacco, cacao, cotton, indigo; *map,* **40–1.**
**Fernie,** Brit. Columbia. City in s.e. corner; pop. 4343; coal mining, fruits; police headquarters for East Kootenay.
**Ferns, 1232–4;** botanical classification, **2831, 2822, 3938;** coal age types, *picture,* **136;** reproduce by spores, **3173.**
**Ferozepur** (*fē-rōz-pụr'*) or **Firozpur.** Town in Punjab, India; pop. 49,341; scene of operations of first Sikh War 1845; now grain trading city; largest arsenal in India.
**Ferrara** (*fĕr-rä'rä*), commercial city of n. Italy; pop. 102,550; in Po valley 30 mi. n.e. of Bologna; medieval seat of famous house of Este; 11th cent. cathedral and massive campanile; 14th to 15th cent. school of painting; **3440.**
**Ferrari** (*fĕr-rä'rē*), **Gaudenzio** (1484–1546). Ital. painter, one of masters of Milan school; work uneven, but excels in heads and draperies; colors bright, harmonious; his paintings usually intensely dramatic ('Holy Family with Saints'; 'Life of Christ'; fresco of 'The Crucifixion').
**Ferrelo** or **Ferrer, Bartolomé, 2596.**
**Ferrero** (*fĕr-rā'rō*), **Guglielmo** (born 1872). Ital. historian, disciple and son-in-law of Lombroso ('Greatness and Decline of Rome'; 'Ancient Rome and Modern America'); brilliant rather than scholarly.
**Fer'ret,** a domesticated breed of polecat, **1234.**
**Ferricyan'ic acid,** a compound of hydrogen, iron, and cyanogen ($H_3Fe(CN)_6$); salts used in blueprints and dyeing, **944, 10.**
**Ferro'cyanic acid,** compound of hydrogen, iron, and cyanogen ($H_4Fe(CN)_6$); used in dyeing, **944.**
**Ferrol** (*fĕ-rōl'*) or **El Ferrol.** Sea port and naval station of n.w. Spain; pop. 26,000; shipping, shipbuilding, fishing.
**Ferro-man'ganese,** an alloy of iron and manganese, **2135.**
**Ferrous sulphate,** green vitriol or copperas, **3390.**
**Ferry** (*fĕ-rē'*), **Jules** (1832–93). Fr. statesman, opponent of the empire; premier 1880–81, 1883–85; promoted free, compulsory, nonclerical education; bitter against Jesuits; pres. of Senate in 1893.
**Ferry,** a passage by boat across river or other narrow body of water; New York, **2495–6,** *picture,* **2495;** railroad, **3218, 2227, 2967,** *picture,* **2970;** S. African, *picture,* **3281.**
**Fertile Crescent,** semicircle of fertile land fringing the Arabian desert, **3425, 297,** *maps,* **298, 1100.**
**Fertiliza'tion,** in biology, **394, 1641–2,** *pictures,* **1643, 395;** accomplished by pollination in flowering plants, **1304–5, 1307–10, 2873;** mosses, **2338–9.** *See also in Index* **Flowers; Reproduction.**
**Fer'tilizers, 1235;** bone tankage, **453;** fish as, **1286;** gypsum, **1554;**

importance in soil, **3273, 1235;** lime, **2010;** manure spreader at work, *picture,* **47;** nitrogenous, **2511–2, 3118, 736,** *pictures,* **737;** phosphorus, **2777;** potassium, **2898–2900;** sewage, **3183.**

**Fes'senden, William Pitt** (1806–69). Amer. statesman and financier, sec. of treasury 1864–65; reestablished financial stability by issuing the famous "7–30" bonds (bearing interest at 7.3 per cent) in denominations as low as $50; U.S. senator 1854–64, 1865 to his death.

**Festivals.** *See in Index* **Holidays and festivals.**

**Fetish** (*fē'tish*) **or fetich,** object worshiped as dwelling-place of a spirit. **2120, 37, 1561.**

**Fetlock** of horse, **1683.**

**Feudal system, 1235–6;** effect of battle of Agincourt, **42;** castles, **654–7;** rise of cities, **769–70;** in Denmark, **997;** Egypt, **1102;** in England, **3739, 3352, 1633–4, 2121;** exploitation of minors, **3546;** fairs and markets, **1219–20;** France, **1352, 1366–7, 1368,** Froissart's chronicles, **1375;** Germany, **1447;** Japan, **1868–9, 1862;** knighthood, **1933–5;** romances of, **3039;** serfs, **3249;** survivals in Channel Isls., **687.**

**Feuds** or **vendettas,** in Albania, 79; in Corsica, **894.**

**Fez,** largest city of Morocco, 125 mi. s. of Strait of Gibraltar; pop. 109,000; caravan trade center and distributing city for N. Africa; independent from 13th to 16th cent.; gave name to cap; univ., **2328.**

**Fez,** brimless red cap worn by Turks, *picture,* **3560.**

**Fezzan** (*fĕ-zän'*), political division of Ital. colony of Tripoli, N. Africa; 156,000 sq. mi.; pop. 70,000; cap. Murzuk; dates, camels, and horses; **3105, 3542.**

**Fianna** (*fē'nȧ*). *See in Index* **Fenians.**

**Fi'at money,** irredeemable paper money made legal tender by law; examples are assignats, **1368, 2282;** greenbacks, **2282, 3605–6;** U.S. "Continentals," **3003.**

**Fiber furniture, 1385.**

**Fiberloid,** artificial celluloid-like substance, **673.**

**Fibers:** hair, **1559–60;** muscle, **2372–3;** nerve, **2437,** *picture,* **2373;** in trees, *picture,* **3531.**

**Fibers,** industrial uses: abaca, **2769;** agave, **42, 2213,** *picture,* **2215;** asbestos, **225;** banana plant, **325, 2769;** in brooms and brushes, **516;** china grass, **2667, 1407;** in cloth, **804;** coir, **818, 516;** cotton, **901–2, 904, 906, 804;** esparto, **2667;** eucalyptus, **1186;** flax, **1291–2, 804;** glass, **1472;** hemp, **1630–1;** hemp harvesting, *picture,* **1631;** henequen, **3244, 2214;** jute, **1905–6;** kitool, **516;** Manila hemp, **2768–9, 325;** Mexican, **2213, 2214, 42, 3244;** papyrus, **2674;** pineapple, **2809;** in rope and twine, **3063–5;** silk, **3240, 804,** *picture,* **1560;** sisal, **3244, 2214, 1630, 42;** wool, **3782, 804,** *picture,* **1560;** yucca, **3835.** *See also in Index* **Fur; Hair; Wool.**

**Fiber silk, 3240, 673.**

**Fibrous roots, 3063,** *pictures,* **348, 2821.**

**Fichte** (*fĭĸ'tē*), **Johann Gottlieb** (1762–1814). Ger. idealistic philosopher who built on the foundation of Kant's teaching; 'Addresses to the German Nation' stimulated patriotic resistance to Napoleon.

**Ficus** (*fī'kŭs*), a genus of trees including figs and the India rubber tree, **1237, 1238, 3073.**

**Fiddle** or violin, **3645–6.**

**Fiddler crab.** Small crabs occurring in great numbers along the e. coast of the U.S., s. of Cape Cod; the male has one claw very largely developed, while the other is small; the waving motion of the large claw has given them their name; all species are vegetarians.

**Fief** (*fēf*), in feudal system, **1236.**

**Field, Cyrus West** (1819–92), Amer. financier, b. Stockbridge, Mass.; projector and promoter of the first submarine transatlantic cable, **560–1.**

**Field, Eugene** (1850–95), Amer. poet and journalist, noted for child poems, **1236–7, 115.**

**Field, Marshall** (1835–1906). Amer. merchant and philanthropist, b. Conway, Mass.; endowed Field Columbian Museum, Chicago.

**Field Artillery,** U.S. Army, insignia, *picture,* **3576.**

**Field Columbian Museum, 725.**

**Field cricket, 921.**

**Field glass, 3463.**

**Field gun, 633.**

**Field hockey, 1669–70.**

**Fielding, Henry** (1707–54), Eng. novelist, called by Byron the "prose Homer of human nature"; 'Tom Jones', a "matchless work of art," often coarse, but always vigorous, clear-sighted, and sincere; **2540, 1166.**

**Field-magnet,** part of dynamo, **1052,** *picture,* **1051;** of electric motor, **1124–5.**

**Field** or **meadow mouse,** rate of increase, **402;** occasional migrations, **2234.**

**Field of the Cloth of Gold,** plain in n. France, near Calais, so called from display on occasion of meeting of Henry VIII and Francis I, **1636.**

**Fiesole** (*fē-ā'zo-lā*). A town in Italy 3 mi. n.e. of Florence; pop. 10,000; home of Fra Angelico; anc. Faesulae, important Etruscan city.

**Fife, Louise, Duchess of** (born 1867), **1089.**

**Fife.** A maritime county in e. Scotland; 492 sq. mi.; pop. 270,000.

**Fife,** musical instrument, **3781,** *picture,* **2382.**

**Fifth Avenue,** famous street of New York City, **2491, 2494,** *picture,* **2492.**

**"Fifty-four forty or fight," 2872, 2597.**

**Figaro** (*fē-gä-rō'*). The daring witty roguish barber in Beaumarchais' 'Barber of Seville' and 'The Marriage of Figaro'; a brilliant Parisian periodical is named for him.

**'Figaro, Marriage of',** opera by Mozart, **2363, 3181, 2584.**

**'Fighting Téméraire',** picture by Turner, **1246.**

**Figs, 1237–8.**

**Figure eight knot, 1939,** *picture,* **1940.**

**Figures of speech, 1238–9;** slang, **3248.**

**Fig-wasp, 1237–8,** *picture,* **1238.**

**Fiji** (*fē'jē*) **Islands,** group of about 250 isls. of Pacific; pop. 150,000; Brit. crown colony; **1239,** *maps,* **264–5, 2624–5;** sandalwood, **3123.**

**Filament,** in audion, **257,** *picture,* **3761;** in electric lights, **1123, 1124, 3548;** in flowers, **1304.**

**Filaria** (*fĭ-lā'rĭ-ȧ*), a worm, **3814.**

**Filbert,** a hazel-nut, **1611.**

**Filet** (*fē-lā'*) **lace, 1950.**

**Fil'ibuster.** Originally, a freebooter; now, one who takes part in a military expedition to a foreign country in time of peace for personal aggrandisement or political annexation; Walker expedition to Nicaragua and Dr. Jameson's Raid in S. Africa are famous filibustering expeditions; in legislation, term is applied to one who by dilatory tactics and manipulation of parliamentary procedure delays or prevents passage of bills.

**Filicineae** (*fĭl-ĭ-sĭu'ĕ-ē*), the fern class of plants, **1234.**

**Filipinos,** natives of the Philippine Isls., **2766–9.**

**Fillmore, Millard** (1800–74), 13th president of the U.S., **1239–41;** Compromise of 1850, **855–6;** Perry's expedition to Japan, **1862.**

**Film,** photographic, **2782;** in motion pictures, **2348, 2350, 2352,** *pictures,* **2354–6;** non-inflammable, **673, 2352.**

**Filter press,** filter through which liquid is forced under pressure; in sugar-making, *picture,* **3387.**

**Filtration,** of sewage, **3183;** of water, **3703.**

**Finance,** the work of obtaining and using money and credit for the support of private and public enterprise; banks and banking, **327–9;** corporations, **893–4;** credit, **917–8;** economic theory of capital, **1077;** national debts, **2399;** paper money, **2282;** stocks and bonds, **3358–60;** tariff, **3437–8;** taxation, **3440–2.** *See also in Index* **Money; United States:** *Finance and Currency;* also the subjects above.

**Fin-back whale, 3724,** *picture,* **3725.**

**Finch family,** the *Fringillidae,* a large family of seed-eating birds, **1241, 412,** *pictures,* **418;** buntings, **534;** canaries, **627–8;** cardinal, **643;** grosbeak, **1542–3;** sparrows, **3308.**

**Findlay,** Ohio. A mfg. city and oil center 43 mi. s. of Toledo; pop. 17,021; auto parts, beet sugar, bricks, oil products, glass, canned goods, rubber goods, furniture, steel products.

**Fine arts, 1242–7,** *Study Outline,* **4004;** Aegean, **28, 29;** architecture, **176–89;** "classic spirit" defined, **912;** distinguished from useful, **1242;** drama, **1031–9, 2625–6;** embroidery, **1140;** enameling, **1145–8;** engraving, **1168–72;** etching, **1168–70;** Europe's treasures, **1197–1207;** Madonna in, **2108;** influence of William Morris, **2329;** music, **2376–81;** painting, **2627–41;** photography as, **2784,** *picture,* **2781;** poetry, **2850–1;** pottery, **2906;** prehistoric, **668,** *pictures,* **666, 668;** in Renaissance, **2995–7;** Ruskin's influence, **3083;** sculpture, **3154–64;** tapestry, **3433–4;** unity or "composition," **1243–6.** *See also in Index* **Architecture; Painting; Sculpture;** etc.; and names of various artists, peoples, and countries.

**Fingal** (*fin-gal'*). A name by which the legendary Celtic hero Finn MacCool was sometimes known in Scotch legend; popularized by Macpherson's epic 'Fingal'.

**Fingal's Cave,** Scotland, **666,** *picture,* **3148.**

**Finger, 1571.**

**"Finger Lakes,"** N.Y., **2482;** made by glaciers, **1721.**

**Finger nails,** developed from epidermis, **3246;** Chinese fashion, **742.**

**Finger-prints, 1247–8, 3246.**

**Finger-sponge, 3328.**

**Finisterre** (*fin-is-tĕr'*), **Cape** ("land's end"). High promontory on n.w. coast of Spain; naval victories of English over French 1747, 1805.

**Finland,** republic of n. Europe; 128,000 sq. mi.; pop. 3,150,000; cap. Helsingfors; **1248, 1191,** *maps,* **2531, 1196–7;** ceded to Russia (1809), **3404;** coöperative societies, **879;** Lapland, **1962;** woman suffrage, **3779.**

**Finland, Gulf of,** arm of Baltic Sea between Finland on n. and Esthonia and Russia on s.; length 260 mi.; width 25 to 80 mi.; *map,* **2531.**

**Finlay River,** Canada, headstream of Peace R.; rises in n.-cent. Brit. Columbia; **512, 2699.**

**Finley, John,** Amer. pioneer and Indian trader, **464.**

**Finnan haddie,** smoked haddock, **1278.**

**Finney, Charles Grandison** (1792–1875), American Cong. minister, b. Warren, Conn.; famous revivalist preacher; became pres. of Oberlin College 1852; **911.**
**Finnish language and literature, 1248.**
**Finn MacCool** or **Fionn Maccumhail.** Celtic (Irish) legendary hero, leader of the Fianna (Fenians), wooer and finally husband of Grania, and father of the bard Ossian (Oisin).
**Finno-Tatars,** the great division of the human family which includes the Finnic or Finno-Ugric peoples of Europe and the Mongolo-Tatars of Asia, **2956.**
**Finno-Ugric,** name of a division of Ural-Altaic family of languages and their speakers; Finns include not only inhabitants of Finland, but similar tribes in Russia, etc.; Ostiaks, Voguls, and Magyars, allied tribes, are called Ugric, from Yura or Ugra, country on either side of Ural Mts.; Finns, **1248;** Magyars, **1703.**
**Finns,** people of Finland, **1248;** racial affiliations, **1180, 3557.**
**Fins,** of fish, **1271, 1272, 1274.**
**Finse,** resort in Norway, **2530.**
**Finsteraarhorn** (*fĭn-stĕr-är'hôrn*), highest summit of Bernese Alps; 40 mi. s.e. of Bern, Switzerland (14,022 ft.); **3413.**
**Fiords** (*fyôrds*), long, narrow deep arms of sea running far inland; origin, **2788,** *picture,* **2789;** Alaska, **77;** Brit. Columbia, **510;** New Zealand, **2499;** Norway, **2529–30, 2532,** *picture,* **2534.**
**Fir,** a cone-bearing tree, **1248;** distinguished from other conifers, **3539, 2809, 3332;** Douglas fir really a pine, **3332.**
**Firdausi** (*fĕr-dou'sē*), **Firdousi,** or **Firdusi** (940?–1020), Persia's greatest poet; real name Abul Kasim Mansur; author of the 'Shah Namah', or Book of Kings, an epic history of Persia from the legendary kings to the Mohammedan conquest, 641 A.D.; **2738.**
**Fire, 1249–51, 2611;** burning glass, **1620;** camp, **597–9,** *picture,* **1261;** extinguishers, **1261–2;** forest, **1328, 1331,** *pictures,* **1329, 1330;** caused by friction, **1618;** great fires, **1262, 2498;** loss, in U.S., **1260;** matches, **2170;** prehistoric races, **771,** *picture,* **772;** Prometheus legend, **2921;** St. Elmo's, **2007;** smothered by carbon dioxide, **642.**
**Firearms, 1252–7;** bullets and shells, **1254, 1256, 1973–4;** cannon, **633–6;** early development, **1252–4;** machine gun, **2097–2101;** pistols and revolvers, **1256;** modern rifles, **1254, 1255, 1556;** shotguns, **1256–7;** mfrs. in U.S., **863, 3332,** *picture,* **865;** World War developments, **3791.** *See also in Index* **Cannon.**
**Fire brick, 505.**
**Fire clay, 785;** in glass-making, **1471.**
**Fire department, 1257–62;** high-pressure water systems, **3703.**
**Fire extinguishers,** chemical, **1262, 1260.**
**Fire fish,** a brilliant red fish found in tropical seas, *picture,* **1271.**
**Fireflies and glowworms, 1262–3;** phosphorescence, **2776.**
**Fire insurance, 1791–2.**
**Firenze** (*fē-rĕn'tsā*). Ital. name for Florence.
**Fire-pink,** a flower, **2809.**
**Fire pistol,** old-time fire-lighting implement, *picture,* **1251.**
**Fireplaces, 3368;** heating efficiency, **1621, 1622.**
**Fire prevention, 1260–2;** fireproofing, **1263, 225, 531;** protection of forests, **1328–31;** thermostat, **1624.**
**Fireproofing, 1263;** asbestos, **225;** modern office-buildings, **531.**
**Fires, great, 1262.**
**Fire,** or **spotted, salamander, 3112.**
**Fire-tube boilers, 3349.**
**Fireworks, 1264–6, 751;** parachutes used with star shells, **2674.**
**Fire-worship, 1249, 1250;** in Zoroastrianism, **3841–2, 1749.**
**First aid, 1266–70;** antidotes for poisons, **2854–5, 1270;** camper's kit, **596, 1266;** emergency hints, **1269–70;** snake bite, **3260, 1269.**
**Firth** or **fiord,** inlet of the sea, **2788, 3146,** *picture,* **2789.** For particular firths *see* under proper name, as **Clyde, Firth of.**
**Fish Hamilton** (1808–93). U.S. sec. of state 1869–77; had influential part in settling *Alabama* claims dispute.
**Fish, 1271–9,** *Study Outline,* **3948;** aquariums, **162–3, 3852;** classification, **1271–2, 3634;** deep-sea, **2556–7;** eels, **1089;** eggs, **1275, 1090, 2558,** *pictures,* **1091;** "electric" fishes, **1276, 3517, 1089–90;** evolution, **1277, 1209, 2997;** evolutionary position, *diagram,* **128;** eyes, **1274, 1213;** food fish, table, **1278–9;** geologic history, **1277, 1418, 1420;** gills, **1274, 2998;** hatcheries, **1280–2;** mudfish, **1275–6, 2363–5;** need oxygen, **2612;** poisoned by certain plants, **2854;** protective coloration, **1274–5, 2923–4;** reproduction, **1275, 1090, 2558;** respiration, **1274, 2998, 1403;** seasonal migrations, **2234;** sharks the oldest type, **1271–2, 1277, 3196;** skeleton, *picture,* **3245;** structure, **1272, 1274;** teeth, **1274, 3452, 3196;** tunny warm blooded, **3553.** —*Industrial products:* fertilizer, **1277, 1235;** gelatin, **1409;** glue, **1476;** isinglass, **1279, 1832, 3374;** oil, **1277, 3197;** shagreen, **1272, 3196.** *See also in Index* the important fishes, as **Bass, Carp,** etc., by name.
**Fish Commission, U.S.** *See in Index* **Fisheries, Bureau of.**
**Fish culture, 1280–2;** how the "fish doctor" works, *pictures,* **1277;** salmon, **3114.**
**Fisher, Dorothy Canfield.** *See in Index* **Canfield, Dorothy.**
**Fisher, Harrison** (born 1876). Amer. illustrator, b. Brooklyn, N.Y.; won popularity through well-known type of "American girl."
**Fisher, John** (1469?–1535). Eng. bishop, chancellor of Cambridge; friend of Erasmus and leader in New Learning; opposition to Henry VIII's divorce and refusal to recognize him as head of English church led to execution for treason.
**Fisher, Sir John,** later Baron Fisher (1841–1920). First sea lord of Brit. admiralty (1904–10 and 1914–15), pioneer in introduction of dreadnoughts and all-big-gun ships.
**Fisher,** or black marten, **2156.**
**Fisher fur, 1390.**
**Fisheries, 1282–6;** Alaska, **74, 79, 3167;** Arctic regions, **190;** Canada, **610, 510, 512, 1690, 2449, 2538,** *pictures,* **1283, 1284;** Caspian Sea, **654;** Denmark, **994;** Europe, **1190;** France, **1347, 514;** Gt. Brit., **1150, 1286, 2528;** Hanseatic League, **1576;** Iceland, **1724;** Japan, **1864, 2616, 3167;** Labrador, **1948;** Mediterranean, **2194;** Newfoundland, **2450;** North Sea, **2528;** Norway, **2532, 2534, 2536;** Russia, **190, 3086, 3167.** —*U.S.,* **3590, 1283–6;** Chesapeake Bay, **2160, 716;** Del., **987;** dispute with Gt. Brit., **1611, 3168;** Great Lakes, **1512;** La., **2070;** Me., **2128, 1645;** Mass., **2166, 472;** Ore., **2596;** Wash., **3687–8,** *pictures,* **3689, 1284.** *See also in Index* names of chief food fishes.
**Fisheries, Bureau of,** U.S., government bureau devoted to biological and statistical studies of fish and fisheries, maintenance of hatcheries, and replenishing fishing grounds, **1280–2;** lobster propagation, **2042,** *picture,* **2041;** salmon propagation, **3114.**
**Fisher's Hill, battle of,** fought 20 mi. s. of Winchester, Va. (Sept. 1864), **3204.**
**Fishes** (Latin *Pisces*), a sign of the zodiac, **3840.**
**"Fishes, Age of," 1418.**
**Fishguard,** Wales. Seaport of Pembrokeshire in n. on Fishguard Bay, excellent harbor; fisheries; "Fishguard Invasion" of French under Gen. Tate, Irish-Amer. adventurer (1797).
**Fish-hawk, 1606–7, 1055.**
**Fish tapeworm, 3813.**
**Fish wheel,** for catching salmon, **1285–6,** *picture,* **1284.**
**Fiske, Bradley Allen** (born 1854). Amer. naval officer and inventor, b. Lyons, N.Y.; rear-admiral, U.S. Navy, 1911–16; invented naval telescope sight, resulting in great improvement in naval gunnery, and other devices for warships.
**Fiske, "Jim"** (1834–72). Amer. financial speculator, b. Bennington, Vt.; associated with Daniel Drew and Jay Gould; in Erie raid gained millions and caused wide ruin by attempted corner of gold market ending in "Black Friday" panic of 1869; shot and killed by a former associate.
**Fiske, John** (1842–1901), Amer. historian and philosopher, b. Hartford, Conn.; his clear charming style popularized the theory of evolution and a philosophic view of Amer. history; 'The Critical Period of American History', 'The Discovery of America', etc. form practically a connected history of the U.S.; quoted on Magellan's voyage, **2116.**
**Fiske, Minnie Maddern** (born 1865). Amer. actress of exceptional intellectual and dramatic power, b. New Orleans ("Nora" in 'A Doll's House'; "Becky Sharp").
**Fisk University,** institution for negroes (founded 1866), **2398.**
**Fis'sion,** in biology, reproduction by splitting apart, **672,** *picture,* **671.**
**Fission-fungi** or **Schizophytes,** group of low plants containing bacteria and blue-green algae, **3938.**
**Fitch, Clyde** (1865–1909), Amer. playwright, most popular of his time and also the most prolific; a brilliant but often careless writer; chief plays, **1038.**
**Fitch, John** (1743–98). Amer. inventor, b. East Windsor, Conn.; pioneer in steam navigation.
**Fitch,** a variety of fur, **1390.**
**Fitchburg,** Mass. An industrial city 41 mi. n.w. of Boston; pop. 41,029; pianofortes, tools, machinery, paper, turned-wood novelties, axle grease, textiles.
**Fitton, Mary.** Maid of honor to Queen Elizabeth; supposed by some to be the "dark lady" of Shakespeare's Sonnets.
**Fitto'nia,** a genus of S. Amer. plants, favored for their brilliant foliage; lens-like cell, **1305.**
**Fitz,** prefix in surnames, **2389.**
**FitzGerald, Edward** (1809–83). Eng. poet, whose famous translation of Rubaiyat of Omar Khayyam is an almost unique instance of successful 'transplantation' of a foreign poem.
**Fitzroy River,** one of chief rivers of Western Australia, navigable about 100 mi.; flows into Indian Ocean; *map,* **264–5.**
**Fiume** (*fē-ŭ'mā*), independent city-state on Adriatic Sea, created after World War; 8 sq. mi.; pop. 50,000; **1286, 272;** seized by D'Annunzio, **3812, 1833.**

**Five Civilized Tribes,** name applied to Cherokee, Chickasaw, Choctaw, Creek, and Seminole tribes living in Oklahoma; progress and govt., **2576.**
**Five Forks, battle of,** fought April 1, 1865, 11 mi. s.w. of Petersburg, Va., **3205.**
**Five Nations,** confederacy of five tribes of Iroquois Indians, formerly living in cent. and w. N.Y., **1766.**
**Fixed nitrogen, 2511, 2512.**
**Fixed oils, 1225.**
**Fixed pulley,** *picture,* **2189.**
**Fixed stars, 3342.**
**Fizeau** (*fē-zō'*), **Armand H. L.** (1819–96), Fr. physicist; measures speed of light, **1997.**
**Fjord.** Same as **Fiord.**
**Flag,** an iris, **1814.**
**Flag Day** (June 14), **1288.**
**Flagella** (*flă-ĝĕl'ă*). Same as **Cilia.**
**Flagella'ta,** class of unicellular animals with tail or "flagellum," **3944.**
**Flagg, James Montgomery** (born 1877). Amer. author and illustrator; frequent contributor to *Life* and other magazines; wrote 'All in the Same Boat', 'The Adventures of Kitty Cobb', 'The Mystery of the Hated Man', and other books, all illustrated by himself.
**'Flag Goes By, The',** poem, **1288.**
**Flagler, Henry M.** (1830–1913), Amer. capitalist, conspicuous in the development of Florida; builds Key West r.r., **1921, 1297;** associated with Rockefeller, **3034.**
**Flags, 1287–8;** British, **1510, 1287;** Chinese, **749;** U.S., **1287–8, 1900.**
**Flag signals, 3233,** *picture,* **3232.**
**Flagstaff,** Ariz., town 100 mi. n. of Phoenix; pop. 3186; Lowell observatory; **200, 2552.**
**Flail, 3493.**
**Flame, 1250, 1710;** acetylene, **7–8;** oxy-hydrogen, **1710.**
**Flamin'go, 1289;** foot, *picture,* **1323;** scarlet, **414.**
**Flamin'ian Way** (*Via Flaminia*), road from anc. Rome to Ariminum (modern Rimini), constructed by censor Flaminius (220 B.C.), **3056.**
**Flamininus** (*flăm-ĭn-ī'nŭs*), **Titus Quintius** (228?–174 B.C.). Rom. general, victor of Cynoscephalae (197 B.C.) and "liberator of the Greeks."
**Flammarion** (*flă-mä-rē-ôn'*), **Camille** (born 1842). Fr. astronomer and writer of popular scientific books ('Marvels of the Atmosphere').
**Flanders,** dist. in w. Europe, **1289;** cities, **152–3, 518–20, 1456, 2008, 2073, 3833–4;** painting, **2630–1, 2997, 3618, 3076;** medieval tapestry, **3434;** medieval trade, **372–3, 518, 3833.**
**Flanders, battles of** (Ypres and Passchendaele Ridge), in World War, **3810, 3834, 3797, 941.**
**Flannel,** a loosely woven woolen fabric, with soft surface, **804.**
**Flash boilers, 3349.**
**Flashlight powder,** in photography, **2783, 2121.**
**Flatbush,** now part of Brooklyn, N.Y.; "Flatbush Pass," strategic point in Rev. War; **515.**
**Flatfish, 1289–91;** flounder, **1301;** halibut, **1565, 1278;** turbot, **1279.**
**"Flat-foot," 1324.**
**Flathead Indians,** tribe of Salishan stock formerly dwelling about Flathead L. and R. in n.w. Mont., and in surrounding territory; the Blackfeet were their hereditary enemies; **1767.**
**Flathead Lake,** Mont., 40 mi. s. of Glacier National Park; 30 mi. long, 12 to 14 mi. wide; *map,* **2309.**
**Flathead River,** Mont., issues from s. end of Flathead L. and enters Clark Fork after course of 75 mi., **2310.**
**Flatworms, 3813, 3945.**
**Flaubert** (*flō-bĕr'*), **Gustave** (1821–80), Fr. novelist and literary artist, whose extraordinarily perfect and polished style was the result of tireless labor—sometimes a week to a page; **1365, 2541,** *picture,* **1364.**
**Flavors.** *See in Index* **Essential oils; Spices and condiments.**
**Flax,** plant cultivated for fiber, from which linen is made, and for its seed, also called linseed, **1291–2;** flower and branch, *pictures,* **1226;** linen fabrics, **804, 2018;** seed-pod, *picture,* **2523;** in Argentina, **192;** Belgium, **372;** Canada, **608, 3128;** anc. Egypt, **1098;** France, **1346;** Ireland, **1807,** *pictures,* **1291;** Italy, **1840;** Russia, **3086;** in U.S., **1292, 2525;** Uruguay, **3608.**
**Flaxman, John** (1755–1826), Eng. sculptor and designer, often charming but obsessed by classicism, **3158.**
**Flea, 1292, 2678,** *pictures,* **2680, 1292.**
**Fleabane.** A common name for plants of the genus *Erigeron,* having a peculiar aromatic odor, which is said to keep away fleas; they are native to the U.S.; *E. canadensis* and *E. philadelphicus* are valued medicinally for their oil, which is a strong irritant.
**Fleet.** A stream in London, flowing into Thames, now converted into large sewer; gives name to Fleet Street and Fleet Prison.
**Fleet Street,** London, *picture,* **2053.**
**Fleming, John Adam** (born 1877), Amer. physicist; **257.**
**Fleming, Sir Sandford** (1827–1915). Canadian engineer and publicist; built Intercolonial Railway, surveyed main line of Canadian Pacific; proposed standard time system now used in U.S. and Canada.
**Flemish language, 1289, 376.**
**Flemish painting, 2630–1, 2997, 3618, 3076.**
**Flemish people,** inhabitants of Flanders, **372–4, 376.**
**Flensburg** (*flĕns'bŭrĸ*), seaport and mfg. city of Germany in Prussian province of Schleswig-Holstein; pop. 61,000; **997.**
**Flesh fly** or **blow-fly,** any one of several large, noisy blue or green flies which deposit their eggs or larvae in meat or other animal matter; bluebottle fly is a familiar type; egg, *picture,* **1091.**
**Fletcher, Horace** (1849–1919). Amer. food expert, b. Lawrence, Mass.; emphasized importance of prolonged mastication of food, giving rise to the verb "fletcherize."
**Fletcher, John** (1579–1625), Eng. dramatist, collaborator with Francis Beaumont, **1034, 1164;** chief works, **1038.**
**Fletcher, John Gould** (born 1886). Amer. poet of "modernist" tendencies; wrote 'Irradiations—Sand and Spray'; 'Goblins and Pagodas'; 'Japanese Prints'.
**Fleur-de-lis** (*flûr-dē-lē'*), a white iris, **1814.**
**Fleurus** (*flû-rüs'*). A small town in Belgium, 28 mi. s.e. of Brussels; scene of 4 important battles in Span. and Fr. wars.
**Flex'ner, Simon** (born 1863), Amer. pathologist and bacteriologist, b. Louisville, Ky.; since 1903 director of laboratories, Rockefeller Institute for Medical Research; **1892.**
**Flicker,** a woodpecker, **3780,** *pictures,* **416, 3780;** courtship, *picture,* **406;** number of insects consumed, **402;** protective coloration, **2924.**
**Flickertail State, 3347.**
**Flight,** bat, **345, 346;** bee, **364;** birds, **400,** *picture,* **402;** fly, **1313;** mosquito, **2338.** For flying-machines *see in Index* **Airplane.**
**Flinders River,** in Queensland, Australia, flowing into Gulf of Carpentaria; *map,* **264–5.**
**Flint,** Mich., city on Flint R. 58 mi. n.w. of Detroit; pop. 91,599; automobiles, automobile parts, airplane motors, varnishes, farm implements; center of grain trade; **2224.**
**Flint,** a mineral, **1292;** formation of, *picture,* **1335.**
**Flint and steel,** in making fire, **2170, 1249,** *picture,* **1251.**
**Flint** or **crystal glass, 1472.**
**Flint implements, 3360–1.**
**Flint-lock, 1252, 1254,** *pictures,* **1253.**
**Flint River,** La., a r. rising near Atlanta and flowing 350 mi. s. and s.w. uniting with the Chattahochee to form the Apalachicola; *map,* **1432.**
**Floating** (swimming), **3410,** *picture,* **3411.**
**Floating bodies,** law of (principle of Archimedes), **1509.**
**Floating dry-dock, 1579.**
**Floating plants, 3700.**
**Flodden** or **Flodden Field,** in Northumberland, England, near Scotch border; Sept. 1513, English under Earl of Surrey defeated and killed James IV of Scotland; Scott's 'Marmion' gives account of the battle; **3148.**
**Flood, Henry** (1732–91). Irish orator and political leader; handsome, witty, cultured; member Irish House of Commons 1759–83; Brit. House 1783–90; sought complete legislative independence of Ireland.
**Flood,** excessive supply of water in river or lake sufficient to cause overflow beyond normal banks, **2791;** caused by deforestation, **3532, 1759–60;** Ganges, **1393;** Hwang R., **1706;** legends of, **1000, 299;** Mississippi R., **2266–8;** Nile, **2510; tidal, 1574.**
**Flood control,** in engineering; at Dayton, **970;** floods prevented by lakes, **3023;** levees, **2268, 3023;** on Mississippi, **2266, 2268;** Nile, **1094, 1828,** *picture,* **1096;** storage at high water, **970, 1094, 2266.**
**Flood plain,** in physiography, **2791, 3023.**
**Flora,** Rom. goddess of flowers and spring, identified with Gk. Chloris, **2175;** statue, *picture,* **1204.**
**Flora.** All the plants of a region or division of geologic time. For the flora of a region *see in Index* the region by name.
**Florence,** Ala., industrial city on Tennessee R. in n.w. corner; pop. 10,529; wagons, stoves, boilers, and cotton goods; growing rapidly with development of Muscle Shoals; **72, 2512.**
**Florence,** 2d city of cent. Italy; pop. 242,000; famed for historical associations and art treasures; **1293–4, 1846–50;** Mrs. Browning, **516;** early use of cannon, **1552;** Dante, **958;** Ghiberti's doors, **1456,** *picture,* **1457;** Giotto's works, **1461–2,** *picture,* **1462, 1834;** Medici rule, **2191, 696;** famous painters, **2629, 2630;** Pisa conquered, **2811;** Savonarola, **3130–1.**
**Florence,** S.C. Railroad city and trade center for cotton and tobacco region, 96 mi. n.e. of Charleston; pop. 10,968; South Carolina Industrial School; state agricultural experiment station.
**Flores** (*flō'rēs*), isl. of Dutch E. Indies, e. of Java; 5850 sq. mi.; pop. 250,000, mostly Papuan savages; exports sandalwood, rubber; *map,* **1072.**
**Flores,** westernmost isl. of Azores; 57 sq. mi.; pop. 9000; **288.**
**Florian** (*flō-rē-äń'*), **Jean Pierre Claris de** (1755–94). Fr. poet whose 'Fables' are part of every Fr. schoolchild's education; all his works are delicately sentimental.

**Flo'riculture,** flower gardening, **1396.**
**Flor'ida,** a gulf state of U.S.; 58,666 sq. mi.; pop. 968,470; cap. Tallahassee; **1295–1300,** *maps,* **1297, 1298, 3584–5;** alligators, **98, 1298;** bird life, **1298, 1300, 3362, 3364, 1289;** chief cities, **1300, 1858–9, 1921, 3107;** climate, **1295, 1921;** cotton, **904;** Everglades, **1298–1300, 1208, 1295;** fisheries, **1297–8, 3329–30;** fruit industry, **1296, 1297, 1500, 2588;** mineral phosphates, **1296, 1235, 2777,** mine, *picture,* **1300;** origin of name, **3347;** ostrich farming, **1859, 2603;** population, **1297, 1300;** railroads, **1296–7, 1921;** St. Johns R., **1298, 1858;** state flower, **3347;** timber, **1297, 946, 3432;** tobacco and cigar industry, **1921, 3509.** —*History,* **1295–6;** Ponce de Leon seeks Fountain of Youth, **2878;** De Soto appointed gov., **999;** Huguenot colony, **826;** St. Augustine, **3106–7;** ceded to England, **3180;** returned to Spain after Rev. War, **3004;** W. Fla. rebels, **2072;** purchased by U.S. (1819), **2306, 1295;** Seminole Indian War, **1773, 1856;** secedes, **857;** recent economic development, **1296–7.**
**Florida, University of.** State institution for men at Gainesville, Fla.; established 1905; arts and sciences, agriculture, engineering, law, teachers' college.
**Florida Keys, 1921, 1295, 884.**
**Florida moss.** Same as **Spanish moss.**
**Florida Parishes, 2072.**
**Florida State College.** At Tallahassee, Fla.; for women; reorganized 1905 (established as seminary 1857); arts and sciences, education, business, art, music, home demonstration work.
**Florida Straits,** or New Bahama Channel, waters separating Fla. from Cuba and the Bahamas; traversed by Gulf Stream; **1548, 1549.**
**Florin** (from Latin *flos,* "flower"). Florentine gold coin, first used in 13th cent.; so named because of lily on the obverse; also modern Austrian and Dutch coins, both worth about 40 cents; Eng. 2-shilling piece also called florin.
**Flor'izel,** in Shakespeare's 'A Winter's Tale', prince of Bohemia, lover of Perdita, the daughter of the king of Sicilia, whom he weds as a shepherdess, **3756–7.**
**Floss silk,** the outside of cocoons, **3238, 3240.**
**Flotow** (*flō'tō*), **Friedrich von** (1812–83). Ger. composer of light opera ('Martha'; 'Alessandro Stradella'); pleasing melodies and lively dramatic action.
**Flot'sam, jetsam, and ligan** (or lagan). Eng. legal terms; flotsam means shipwrecked goods which float; jetsam, goods thrown overboard and lost; ligan, goods which sink but are fastened to a buoy so that they may be recovered. The words are often used figuratively to refer to human wrecks.
**Flounder,** a flatfish, **1301, 1289–91,** *picture,* **1291;** Denmark, **994.**
**Flour and flour-milling, 1301–4;** banana, **325;** barley, **331, 3730;** bread and baking, **496–500;** buckwheat, **524;** cracker industry of U.S., **500;** corn, **890, 3730;** cost in Civil War, **781;** importance as industry, **1304;** methods of milling, **1301–3;** in Minneapolis, **2252, 1304;** "patent" process, **1302–3;** potato, **2901;** rye flour, **3102, 3730;** soy bean, **3297;** weight of legal barrel, **3715;** wheat varieties, **3732, 3730, 1302–3.**
**Flowering plants,** the highest form of plant life, **2822.**
**Flowers, 1304–11, 3849, 2827;** artificial pollination of date palm, **966;** composite type, **1305, 237;** growing for market, **1396, 3066;** growth and structure, *pictures,* **474;** in Japan, **1863;** nature study, **2406–17;** perfumes **2726–9;** pollen carried by insects, **1304, 1788, 2593, 1237, 809, 362;** trees, **3533–5;** yucca's strange fertilization, **3835.** *See also in Index* the various flowers by name.
**Flowers, state, 3347.**
**Flowers of sulphur, 3390.**
**Fluid theory of electricity, 1112.**
**Flukes,** parasitic worms, **3813;** evolutionary position, *diagram,* **128.**
**Flu'orine,** a gaseous chemical element, **755, 4042.**
**Flu'oroscope,** *picture,* **3826.**
**Flu'or-spar** or **fluorite,** a calcium fluoride; a source of hydrofluoric acid, and used as a flux in smelting; in Ill., **1733;** relative hardness, **2248.**
**Flush,** young leaf shoots of tea, **3446.**
**Flushing,** fortified port in s.w. Netherlands on isl. of Walcheren; pop. 23,000; formerly important naval station; shipbuilding, iron and steel works; its guns command mouth of Scheldt R.; **3136.**
**Flute,** a musical instrument, **3781, 2383;** in orchestra, **2590–1;** *picture,* **2382.**
**Flux,** a substance which promotes the fusing of metals; limestone, **1820, 2010;** borax, **3271, 464;** in welding, **3716.**
**Flux'ions,** Newton's name for calculus, **2476.**
**Fly,** an insect, **1312–3, 1788;** caddis larva builds house, *picture,* **1786;** dragon-fly, **1028–30;** eggs, *pictures,* **1091;** eye, *picture,* **1215;** fairy-fly, **131;** fossilized in amber, *picture,* **106;** hover-fly, **1790, 1791,** *pictures,* **1791;** ichneumon, **1724;** lacewing, **1789–90, 1791,** *picture,* **1789;** length of life, **126;** preyed upon by swallows, swifts, and martins, **3398;** scorpion-fly, foot, *picture,* **1784;** Spanish, **370;** tsetse, **3546–7;** wing (magnified), *picture,* **2229.**
**Fly amani'ta,** a poisonous mushroom, **2375,** *picture,* **2374.**
**Flycatcher family** or *Tyrannidae,* a family of insect-eating birds, **412, 1313,** *pictures,* **1314;** includes kingbird, **1925,** *picture,* **417,** phoebe, and pewee; seasonal migration, **2231.**
**Flycatchers,** all birds of the flycatcher family not otherwise named, **1313–4,** *picture,* **2412.**
**Flying buttress,** in architecture, **184, 186,** *pictures,* **186, 1199.**
**Flying-dragon,** a Malayan lizard, **2036.**
**Flying Dutchman.** A legendary Dutch sea-captain, doomed for a rash oath or as punishment for crime to beat about the Cape of Good Hope till Judgment Day; subject of opera by Wagner.
**Flying-fish, 1314, 1277,** *picture,* **1273.**
**Flying fox,** species of Malayan bat, **346, 468, 1877.**
**Flying machine, 54–68.** *See also in Index* **Airplane; Balloon.**
**Flying squirrel, 3334,** *picture,* **3333.**
**Fly mushroom,** or fly amanita, **2375,** *picture,* **2374.**
**Fly River,** of Papua, Brit. New Guinea; rises near w. border and flows s.e. entering Gulf of Papua by a delta; **2453,** *map,* **1073.**
**Fly-wheel,** a heavy wheel whose weight resists sudden changes of speed, thus insuring uniform motion; of steam engine, **3348, 3349.**
**Fo'cal length,** in optical instruments, **1987, 3463.**
**Focal plane,** of camera, **1987;** found by focusing, **2779–80.**
**Foch** (*fôsh*), **Ferdinand** (born 1851), Fr. general and marshal of France, commander-in-chief of Allied armies in World War, **1315;** assumes command of Allied armies, **3805, 3275;** presents terms of armistice, **3808.**
**Fo'cus,** in optics, **1987;** camera lens, **2780, 2782;** of eye, **1216,** *picture,* **1988;** in telescopes, **3463.**
**Fod'der.** Coarse feed, such as hay, vegetables, given to live stock. *See in Index* **Forage crops.**
**Foehn** (*fŭn*), a warm wind, **3751.**
**Fog, 1316, 809, 2559;** signals, **3233;** smoke a cause, **3254.**
**Fogazzaro** (*fō-gȧt-tsä'rō*), **Antonio** (1842–1911), Ital. novelist and poet, **1833.**
**Foggia** (*fŏj'ä*). City in s. Italy; pop. 80,000; market for agricultural produce of great Apulian plain; Frederick II often a resident.
**Fo'go,** one of Cape Verde Isls., **641.**
**Foil,** a light sword used in fencing, **1232,** *picture,* **3422.**
**Foix** (*fwä*), **Gaston de,** duke of Nemours (1489–1512), Fr. general, **2979.**
**Fokien.** Same as **Fukien.**
**Fokker** (*fŏk'ĕr*), **A. H. G.** (born 1890). Dutch airplane builder, inventor of "Fokker" biplane used by Germans in World War.
**Folio, 458, 2673.**
**Folk-dances, 1316–9;** Bavarian, *picture,* **346;** N. Amer. Indian, **1770–1;** in Pacific Isls., *picture,* **2624;** Siamese, *picture,* **3227;** Spanish, *picture,* **3299;** Swedish, *picture,* **3402.**
**Folkestone** (*fōk'stōn*). Old seaport and watering-place in Kent, s.e. England; pop. 34,000; fishing and shipping center.
**Folk-lore, 1316–9;** cave superstitions, **665, 816;** Celtic, **674, 1814;** dragon in, **1027–8, 3231;** fairies, **1219;** Faust legends, **1227–8;** Grimm brothers' work, **1318;** of India, **1755–6;** legendary origin of fire, **1249, 1250;** literature for children, **2027;** magic, **2117–21;** Mother Goose, **2340;** riddles, **3019;** Scandinavian, **3134;** witchcraft, **3773–4.** *See also in Index* **Mythology; Superstitions.**
**Folk-songs, 1316, 1318, 2377–8, 1436;** Grieg's use of, **1542.**
**Folk-tales, 1316, 1318;** 'Adventures of Robin Hood', **3029–33;** 'The Fairy Calf of Tipperary', **1812–4;** 'How the Mouse Grew So Small', **2360–2;** 'How Mr. Rabbit Lost His Tail', **1586–8;** 'How the Whale Learned to Smoke', **3727–9;** legend of Gundohl and Sukorini (Java), **1877;** 'Reynard the Fox', **1337–8;** 'Song of the Nibelungs', **2504;** 'Siegfried', **3230–1;** 'Wolf-Wind and the Children', **611–5.** For other folk-tales *see in Index* **Stories.**
**Follicle,** of hair, **1560.**
**"Follow the Leader,"** game, **2835,** *picture,* **2833.**
**Fo'malhaut,** a star in the constellation Southern Fish, **3342.**
**Fon'dant,** in candy-making, **630.**
**Fond du Lac** (*fŏn dụ lăk'*). Wis., mfg. and r.r. city, port, and trade center for agricultural region on Winnebago L. at mouth of Fond du Lac R.; pop. 23,427; lumber, grain, flour, leather, paper, machinery, refrigerators; **3772.**
**Fonseca** (*fōn-sä'kä*), **Manoel Deodora da** (1827–92). First pres. of Brazil (1891); dissolved Congress and declared himself dictator, but, finding himself unsupported by army and navy, resigned.
**Fonseca, Gulf** or **Bay of,** inlet of the Pacific, bordering on San Salvador, Honduras, and Nicaragua, **1676;** U.S. naval base, **2505.**
**Font** (type), **3572.**
**Fontaine, Jean de la.** *See in Index* **La Fontaine.**

**Fontainebleau** (*fôn-tān-blō'*), forest-girdled town and resort of n. France, 35 mi. s.e. of Paris, on Seine R.; pop. 14,000; magnificent royal palace; revocation of Edict of Nantes (1685); abdication of Napoleon (1814); Barbizon, on n.w. edge of forest, made famous by painters; **893, 2632, 2240, 454.**
**Fontenoy** (*fôñt-nwä'*). Village in w. Belgium, 45 mi. s.w. of Brussels; French defeated Allies (1745) in War of the Austrian Succession.
**Foochow'**, China, seaport on R. Min, opposite isl. of Formosa; pop. 625,000; **1319–20.**
**Food, 1320–2;** canning industry, **631–3;** carbon the basis of, **642, 2824;** cold storage and refrigeration, **825, 2989–92;** cooking, **875–8;** dehydrated fruits and vegetables, **986–7;** digestion of, **1010–1;** fats and oils, **1225–7;** of infants, **292;** inspection, **1614;** meat packing, **2180–5;** phosphorus compounds, **2777;** plants the ultimate source of, **394, 396, 2556, 2558, 2823–4;** preservatives, **151, 1332;** proteins, **2926, 83;** pure food laws, **2936–7;** rules for eating, **1713;** taste as a guide in diet, **3513;** vitamins, **3651–2.**
**Food Administration,** U.S., **1679, 3802.**
**Food values, 1320–2, 1225–7, 2926;** apples, **161, 1321;** bacon, **1671, 1321;** barley, **331;** beans, **347;** bread, **1321;** breakfast cereals, **501–2;** butter, **544, 1321;** cheese, **709;** chocolate and cocoa, **756;** coconut, **818, 820;** eggs, **2908, 1321, 1322;** fishes, **1278–9;** flour, **1303;** fruits, **1380;** grapefruit, **1500;** macaroni, **2093;** milk, **2238–9, 950;** mushrooms, **2374–5;** nuts, **2545–6;** oats, **2548–9, 1321;** oleomargarine, **2577–9;** olives and olive oil, **2579–80, 1320, 1321;** peanuts, **2700;** peas, **2698;** plantains, **324;** potato, **2900–1;** prunes, **2928;** rice, **3013, 3015;** rye, **3102;** sago, **3104;** salt, **3115–6;** soy bean, **3297;** spices and condiments, **3317;** sugar, **3888;** sweet potato, **3405;** tapioca, **3434;** wheat, **3730.**
**Foolscap, 2673.**
**Fool's gold,** or iron pyrites, **1817, 3390.**
**Foot** (anatomy), **1322–4;** bandaging, *picture,* **1267;** bear, **349;** in various animals, *picture,* **1323;** birds, *pictures,* **409;** camel, **588, 590,** *picture,* **589;** cat, **657;** crawfish, *picture,* **915;** digitigrade, *picture,* **1682;** duck, **1044;** elephant, **1126;** fly, *picture,* **1312;** horse, **1683, 1209,** *pictures,* **1682;** insects, **1782,** *pictures,* **1784;** monkeys, **2288–9;** plantigrade, *picture,* **1682;** seal, **3166,** *picture,* **3168;** of shrike, **3225;** snail, **3256,** *pictures,* **3255, 3256;** spider, *picture,* **3323;** starfish, **3345;** walrus, **3668.**
**Foot,** a division of a verse, **2851.**
**Foot,** a unit of measure, **3715, 3714, 1324.**
**Foot and mouth disease.** An infectious disease to which cattle and pigs are especially subject; characterized by fever, with ulcers about the mouth and feet; epidemics in the U.S. have resulted in great losses of live stock.
**Football, 1324–7,** *picture,* **831.**
**Foot-binding** in China, **742,** *picture,* **744.**
**Foote, Andrew Hull** (1806–63). Amer. rear-admiral, b. New Haven, Conn.; commanded western flotilla in the Civil War, and captured Ft. Henry and Island No. 10.
**Foote, Arthur** (born 1853). Amer. musician, b. Salem, Mass. (compositions for orchestra, songs, anthems, cantatas).
**Foote, Mary Hallock** (born 1847). Amer. illustrator and novelist, b. Milton, N.Y. ('The Led-Horse Claim'; 'The Valley Road').
**Foot-pound.** A unit used in physics; the work done in raising one pound one foot.
**Foot-print identification, 1247.**
**Forage crops,** crops fed to live stock; agave in Mexico, **42;** alfalfa, **88–90;** beans, **347–9;** beets, **365;** buckwheat, **524;** cabbages and turnips, **553–5;** cactus used in Ariz., **202;** carrots, **650;** clover, **809–10;** corn, **888;** cowpea, **910, 347;** hay, **1609, 1502–3;** kafir corn, **1907;** mangel-wurzels, **365;** millet, **2239;** oats, **2548–9;** peanuts, **2700;** peas, **2698;** potatoes, **2900;** rye unsuitable, **3102;** silos and silage, **3240;** sorghum, **3276;** soy bean, **3297, 347.**
**Foraminif'era,** an order of single-celled water-dwelling animals with limy outer coats, **2927, 3944;** bodies make chalk, **685,** limestone, **2010.**
**Forbes-Robertson, Sir Johnston** (born 1853). Eng. actor, one of the most distinguished of his generation; first appeared with Irving and Mrs. Pat Campbell, later as star in his own company in 'As You Like It', 'Hamlet', 'Othello' 'Caesar and Cleopatra', 'The Passing of the Third Floor Back'; his 'Hamlet' considered finest portrayal since Booth.
**"Forbidden City,"** Lhasa, **3496;** Peking, **2707.**
**Force,** in physics, **4028;** centrifugal, **682.**
**Force Bill,** U.S., **1857, 3711.**
**Force pump, 2934,** *pictures,* **2935.**
**Forchheim** (*fôrK'hīm*), Germany. Historic town in Bavaria, 15 mi. s.e. of Bamberg; residence of Carolingians, including Charlemagne.
**Ford, Henry** (born 1863), Amer. manufacturer, b. Greenfield, Mich.; pres. Ford Motor Co., largest automobile plant in world; noted for radical ideas on economic problems and for peace efforts during World War; candidate for senator 1918; how he got his start, **276.**
**Ford, John** (1586–1640?), Eng. dramatic poet; work characterized by dramatic beauty and intensity of passion; 'The Broken Heart', most enjoyable of his plays because, unlike most of them, there is nothing revolting in the central idea of the tragedy; **1034.**
**Ford, Paul Leicester** (1865–1902). Amer. historian and novelist; edited writings of Jefferson, John Dickinson; wrote lives of Washington and Franklin; 'The Honorable Peter Sterling', a novel founded on life of Grover Cleveland.
**Fordham University.** Cath. institution for men at New York City; founded 1841; arts and sciences, law, medicine, pharmacy; present name since 1907; formerly St. John's College.
**Ford's Theater,** Washington, D.C., **2014.** Purchased by U.S. govt. in 1886; collapsed 1893.
**Fore-and-aft rig** of ship, **3209.**
**Foreigners,** in U.S. *See in Index* **Immigration.**
**Foreign exchange,** relative value of legal tender money of two countries; for example, £1 (1 pound) = $4.866½ at the normal rate of exchange; exchange between two countries affected by balance of trade, amount of money owed by each country and its citizens to the other and its citizens, relative soundness of legal tender (that is, probability of redemption in gold), and similar conditions; profoundly affected by World War, **2282.**
**Foreign Legion,** of France, **97.**
**Foreign trade of U.S., 3591.**
**Forest, petrified,** in Ariz., **200;** in Wyo., **3818.**
**Forest cantons** of Switzerland, **3414–5; 3464.**
**"Forest City," 793.**
**Forest Park,** Ill. Residential suburb of Chicago about 2 mi. w. of city limits; pop. 10,768; formerly called Harlem.
**Forestry,** the work of developing and maintaining forests; Canadian forest reserves, **610, 1331;** combatting insect pests, **1328, 1788,** *picture,* **1790;** control of lumbering, **1328, 1331;** duties of forest rangers, **1331;** fighting fires, **1328–30;** in Germany, **433–4, 1441–2;** grazing often harmful, **1328;** practiced extensively in Europe, **1194;** trees, **3530–9;** U.S. forest reserves, **1328, 1331, 870, 25, 2721.**
**Forests, 1327–31;** of Africa, **34, 859,** *map,* **40–1;** Alaska, **74,** *map,* **2514–5;** in Arctic regions, **190;** Asia, **230, 3228, 1748,** *map,* **232–3;** Australasia, **265, 2499, 2453,** *map,* **264–5;** benefit climate, **3532, 795;** in Canada, **610, 512, 2583, 2945,** *pictures,* **606, 607;** conservation movement, **869–70, 1328, 610, 1331, 3060;** drew settlers to western U.S., **3583;** effects of deforestation, **3532, 795, 1759–60, 1194, 3300;** Europe, **1192, 1347, 2532, 2536, 1441–2, 433, 3404,** *map,* **1190–1;** improve soil, **3532;** prevent floods and drouth, **3532;** S. Amer., **3284, 493, 105–6,** *map,* **3288–9;** "swamp" type, **3700;** U.S., **3590,** *map,* **2514–5.** *See also in Index,* **Lumber and timber,** also names of countries and states.
**Forest Service,** Canada, **1331;** U.S., **1331,** *pictures,* **1329, 1330;** conservation work, **3060;** under Dept. of Agriculture, **3597.**
**Forget-me-not,** flower, **1331.**
**"Forked" lightning, 2007.**
**Forks and knives, 1937.**
**Form,** in printing, **458, 2916.**
**Formal'dehyde,** a gas, **1331–2;** used in fumigation, **151;** used in making plastic materials, **673.**
**For'malin,** a solution of formaldehyde, **1331.**
**Formentera** (*fôr-měn-tā'rä*), isl. in the Mediterranean, **307.**
**For'mic acid, 139.**
**For'micaries,** ants' nests, **141.**
**Formic'idae,** ants, **145.**
**Formo'sa,** semi-tropical isl. off e. coast of China; 14,000 sq. mi.; pop. 3,700,000; **1332,** *map,* **1864;** acquired by Japan, **1870;** camphor industry, **594;** tea, **3450.**
**Forms of address.** *See in Index* **Address, forms of.**
**For'mula,** in chemistry, **715–6, 4039.**
**Forrest, Edwin** (1806–72). Amer. tragedian, until the advent of Edwin Booth the most famous the Amer. stage had produced; robust physique and powerful voice, but not as intellectual as Booth; his best characters were Othello, Lear, Richard III.
**Forrest, John, Baron** (1847–1918). Australian surveyor, explorer, and statesman; first premier and treasurer of W. Australia (1890–1901); pres. Australian Federal Council (1897); introduced free homestead system; established Agricultural Land Bank; first Australian to receive peerage.
**Forrest, Nathan Bedford** (1821–77). Confederate Civil War general; cavalry raider; captured Ft. Pillow 1864; said to have been head of the Ku Klux Klan during part of Reconstruction period.
**For'ster, William Edward** (1818–86). Eng. liberal statesman, member of House of Commons 1861 to his death; active in educational interests; secretary for Ireland in Gladstone's cabinet 1880–82, covering time of Phoenix Park murders.
**Forsyth** (*fôr-sīth'*), **Alexander J.** (1769–1843), Scotch clergyman and inventor, **1254.**

**Fortaleza** (*fôr-tä-lā'zä*). Same as **Ceara.**

**Fort Astoria,** fur-trading post founded by employes of John Jacob Astor 1811, on site of present Astoria, Orc., **2597.**

**Fort Benjamin Harrison.** U.S. army post near Indianapolis, Ind.; officers' training camp in World War.

**Fort Benton,** Mont., city on Missouri R.; pop. 1065; head of navigation, **2273.**

**Fort Bliss,** U.S. military post at El Paso, Tex., **1139, 3022.**

**Fort Buford,** N.D., village at head of low-water navigation on Missouri, **2273.**

**Fort Caroline,** Huguenot settlement in Fla., **826.**

**Fort Caroline,** Huguenot settlement Ill. on Mississippi R., n. of Kaskaskia; founded 1720; **1731, 1736.**

**Fort Collins,** Colo. Town 60 mi. n. of Denver; pop. 8755; in fertile irrigated dist.; beet sugar refineries, alfalfa and flour mills; State Agricultural College.

**Fort Crèvecoeur** (*krāv-kûr'*), near Peoria, post built by La Salle on Illinois R., **1964, 1632.**

**Fort Dearborn,** U.S. fort built in 1804 on site of Chicago; famous massacre of white settlers by Indians, Aug. 1812; **725, 3672.**

**Fort de France,** cap. of Martinique; pop. 27,000; port on w. coast; Fr. military and naval station; **2156.**

**Fort Delaware,** on Pea Patch Isl., in Delaware Bay; Civil War prison, **781.**

**Fort Dodge,** Iowa. Trade and r.r. center 70 mi. n. of Des. Moines on Des Moines R.; pop. 19,347; shoes, oatmeal, plaster, gypsum, brick, pottery, plumbing supplies, hardware, clothing.

**Fort Donelson,** strong Confederate fortification on Cumberland R. in Tenn., 63 mi. n.w. of Nashville; taken by Gen. Grant, **1498, 779.**

**Fort Duquesne** (*dü-kān'*), Fr. Colonial fort in Pa., on site of present city of Pittsburgh, **2812, 1362, 3676.**

**Fort Edward,** N.Y. Village on Hudson R. 40 mi. n. of Albany; pop. 3871; fort built here 1755 was an important post during Fr. and Indian War and Rev. War.

**Fort Erie,** Canada, village in Ontario, on L. Erie, at head of Niagara R., opposite Buffalo, N.Y., on site of old Ft. Erie; scene of considerable fighting during War of 1812; **527.**

**Fort Fisher,** Confederate earthworks in N.C. defending entrance to port of Wilmington; captured by Porter, **2884.**

**Fort Frontenac** (*frôn-tĕ-näk'*), Fr. colonial fort on present site of Kingston, Ontario, **1926, 1362.**

**Fort Gaines,** fortification guarding w. entrance to Mobile Bay; seized by Confederates 1861; captured by Farragut, **1225.**

**Fort Garry,** Canada, now Winnipeg, **3752, 2986.**

**Fort George.** Former fort in Canada on Niagara R., opposite Ft. Niagara; taken by Americans under Col. Winfield Scott and Commodore Perry, May 1813.

**Fort Green,** earthworks erected on Long Island during Rev. War; site now Ft. Green Park, Brooklyn, **515.**

**Fort Griswold.** *See in Index* **Groton,** Conn.

**Forth, Firth of,** Scotland, estuary (50 mi. long) of Forth R. on e. coast; *map,* **1159;** cantilever bridge, **506, 1082.**

**Fort Henry,** in n.w. Tenn., 11 mi. w. of Ft. Donelson; captured Feb. 1862 by Federal gunboats under Commodore Foote, acting with land force under Grant; **1498.**

**Fort Howard,** U.S. military post in Md. on N. Point at junction of Patapsco R. and Chesapeake Bay, **322.**

**Fort Jackson.** Confederate fort on Mississippi R. about 80 mi. below New Orleans; vainly besieged for 6 days in April 1862 by Farragut's fleet, which then ran past under heavy fire and captured New Orleans.

**Fort Kearney** (*kär'ni*). On site of present town of Kearney, Neb.; maintained as protection against Indians to travelers on overland trail.

**Fort Leav'enworth,** Kan. Military post, 2 mi. from Leavenworth; U.S. military prison, army school, federal penitentiary; established 1827 to protect Santa Fe trail.

**Fort Logan H. Roots.** An officers' training camp in World War, near Little Rock, Ark.

**Fort Lou'don,** Eng. colonial post in Tenn., **3468.**

**Fort McHenry,** former U.S. military post on Patapsco R. defending Baltimore; bombarded (1814), **322.**

**Fort Mackinac** (*măk'i-nąg*), one of oldest fortifications in U.S., on Mackinac Isl., Mich.; Pontiac captures, **2226.**

**Fort McPherson,** U.S. military post s. of Atlanta, Ga.; officers' training camp in World War; **254.**

**Fort Madison,** Iowa, industrial city 18 mi. s.w. of Burlington on Mississippi R.; pop. 12,066; iron, tin, and rubber products, bricks, cement blocks, machinery, farm implements, fountain pens; state prison; **1804.**

**Fort Man'dan,** winter quarters of Lewis and Clark, **1989.**

**Fort Marion,** old defenses of St. Augustine, Fla., **3107.**

**Fort Massac** (*măs'ăk*), Ill., state park, **1731.**

**Fort Meigs** (*mēgz*), former U.S. fort on Maumee R., n.w. Ohio; famous for defense against English and Indians during War of 1812, **3452.**

**Fort Mims,** temporary stockade 35 mi. n. of Mobile, Ala.; massacre by Creek Indians, **73, 1772.**

**Fort Monroe,** U.S. military post at Old Point Comfort, Va., commanding entrance to Hampton Roads; Jefferson Davis imprisoned, **968.**

**Fort Morgan,** U.S. military post at e. entrance to Mobile Bay, **1225.**

**Fort Moultrie** (*mōl'trē*), fort on Sullivan's Isl. at entrance to Charleston Harbor; abandoned by Federals in Civil War and became one of strong Confederate defenses of Charleston; **699, 1333.**

**Fort Myer,** U.S. military post in Va. on Potomac R. opposite Washington, D.C.; officers' training camp in World War; **3686.**

**Fort Nassau,** Dutch trading post, now Albany, N.Y., **2486.**

**Fort Necessity,** stockade 50 mi. s.e. of Ft. Duquesne in w. Pa., erected by Washington; captured by French (1754), **3676.**

**Fort Niagara,** old fort at mouth of Niagara R., N.Y., established by French; captured by British; surrendered to U.S. 1796; again captured by British 1813; **1362.**

**Fort O'glethorpe.** At Dodge, Ga., 11 mi. from Chattanooga, Tenn.; officers' training camp in World War.

**Fort Omaha,** U.S. military post at Omaha, Neb.; chief balloon school of U.S., **2581.**

**Fort Orange,** erected by Dutch on site of present city of Albany, N.Y., **80;** golf played in 1659, **1486.**

**Fort Pick'ens.** Fort on Santa Rosa Isl., Fla., at entrance to Pensacola harbor; held by Federals throughout Civil War.

**Fort Pillow.** Confederate fort on Mississippi, 40 mi. above Memphis, Tenn.; occupied by Federals June 1862; recaptured April 1864, "massacre of Ft. Pillow."

**Fort Pitt,** Eng. post on site of present Pittsburgh, **2812, 3676.**

**Fort Pontchartrain',** Fr. trading post on site of Detroit, **999.**

**Fort Porter,** U.S. military post on Niagara R. at Buffalo, **527.**

**Fort Prud'homme** (*prü-dōm'*), Fr. post built on present site of Memphis, **3468.**

**Fort Pulaski** (*pū-lăs'ki*). On Cockspur Isl., near Savannah, Ga., commanding both channels of Savannah R.; captured by Federals April 1862.

**Fort Putnam,** Amer. fortification in Rev. War; ruins at West Point, **2238.**

**Fort Riley.** U.S. military post near Junction City, Kan.; cavalry and field artillery schools; officers' training camp in World War.

**Fort St. Louis,** La Salle's post at Starved Rock on Illinois R., **1731, 1964.**

**Fort Sam Houston,** U.S. military post at San Antonio, Tex., **3121.**

**Fort Scott,** Kan. Industrial city on Marmaton R. 87 mi. s. of Kansas City in agricultural and dairying region; pop. 10,693; horse and mule market; r.r. shops and various mfrs.

**Fort Sher'idan.** U.S. military post on L. Michigan 25 mi. n. of Chicago; officers' training camp in World War.

**Fort Smith,** Ark. City on w. border at junction of Arkansas and Poteau rivers; pop. 28,870; large wholesale trade; cottonseed-oil, saw and planing mills; furniture, wagons; adjacent coal mines.

**Fort Snelling,** U.S. military post at junction of Minnesota and Mississippi rivers near St. Paul; officers' training camp in World War; **2257, 3111.**

**Fort Stan'wix,** fort near present site of Rome, N.Y.; treaties with Six Nations 1768 and 1784; rebuilt and named Ft. Schuyler 1776; destroyed and rebuilt again as Ft. Stanwix; Amer. flag first raised (1777), *picture,* **1287.**

**Fort Sum'ter,** in Charleston harbor, S.C.; scene of first engagement of Civil War, **1332–3, 776, 777, 522.**

**Fort Ticondero'ga.** *See in Index* **Ticonderoga.**

**Fortu'na,** in Rom. myth., goddess of fortune, **1333.**

**Fortunate Isles, 628.**

**Fortunatus** (*fôr-tū-nā'tŭs*). Hero of European folk-tale, possessor of proverbial inexhaustible "Fortunatus purse" and wishing-cap which would transport him whereever he desired to go.

**Fortune-telling, 2120.**

**Fortuny** (*fōr-tų'nē*), **Mariano** (1838–74). Great Span. painter and etcher, dazzling colorist, dominant influence in Span. art until rise of impressionism.

**Fort Vaux** (*vō*), before Verdun, France; taken by Germans, **3629.**

**Fort Vermilion,** Alberta, **2699.**

**Fort Wayne,** Ind., interurban and r.r. center in n.e. on Maumee R.; pop. 86,549; steam engines, cars, machinery; site of fort built by Gen. Anthony Wayne (1794); **1760.**

**Fort Wayne, Treaty of, 3452.**

**Fort William,** Brit. post in India founded 1696 to protect traders, nucleus of Calcutta, **573.**

**Fort William,** Ontario, shipping center at head of L. Superior; pop. 25,000; **1333.**

**Fort William Henry,** at s. end of L. George, on site of present Caldwell, N.Y.; surrendered by Eng-

lish to French and Indians under Montcalm (1757); **1362.**

**Fort Worth,** Tex., 4th largest city of state; pop. 106,482; **1333, 3477.**

**"Forty Immortals,"** members of Fr. Academy, **4.**

**"Forty-niners,"** participants in the gold rush to Calif. in 1849, **970, 998;** story, 'How Alice Rode to the Golden Gate', **582–7.**

**Fo'rum,** open space in center of a Rom. city used as market place, for political assembly, amusements; at Rome, **3050,** *pictures,* **3053;** Temple of Janus, **1861.**

**Forward pass,** in football, **1326.**

**Foscari** (*fŏs-kä'rē*), **Francesco** (1373?–1457). Doge of Venice 1423–57; made war against Milan; with son Jacopo forms subject of Byron's tragedy 'The Two Foscari'.

**Fossil gums and resins, 1552, 106.**

**Fossil ivory, 1853.**

**Fossils, 1333–6, 1417–20, 398;** archeopteryx, **138,** *picture,* **401;** elephants, **1126;** evidence for theory of evolution, **1209;** flies, **1313;** horse, **1683, 1322;** insects in amber, **106;** lamp shells, **3814;** marine, found on land, **1417, 2516, 3105, 3421;** prehistoric animals, **132–8;** roaches, **817.**

**Foster, Sir George Eulas** (born 1847). Canadian statesman, long one of the leaders of Conservatives; in Macdonald cabinet 1885–88 as minister of marine and fisheries; minister of finance 1888–96; minister of trade and commerce 1911–21; headed Canadian delegation in League of Nations assembly 1920 and elected vice-pres. of assembly.

**Foundations,** of buildings, **530–1.**

**Fountain of Castalia, 991, 1528.**

**Fountain of Youth, 2878.**

**Fouqué** (*fu-kā'*), **Friedrich de la Motte, Baron** (1777–1843), Ger. romantic poet and novelist, **1436, 1438.**

**Fouquet, Nicolas** (1615–80). Superintendent of finance, and procureur-général under Louis XIV; patron of arts; amassed great fortune and power; put in prison for life 1664.

**Fouquier-Tinville** (*fu-kyā-tăn-vēl'*), **Antoine** (1746–95). Fr. revolutionist; public prosecutor during Reign of Terror; guillotined.

**Fourdrin'ier machine** for making paper, **2668,** *picture,* **2671.**

**Four-eyed fish, 2364–5,** *picture,* **2364.**

**Fourier** (*fu-rĭ-ā'*), **François Charles Marie** (1772–1837), Fr. socialist and political economist; originator of the coöperative community plan known as "Fourierism," tried unsuccessfully at Brook Farm and elsewhere; **3268, 879.**

**Fourment, Helène,** wife of Rubens, **3077.**

**Four-o'clock** or **Marvel of Peru,** a plant that blooms only in the evening and night; inheritance of colors, **1642.**

**"Fourteen Points,"** the terms of peace suggested by Pres. Wilson in 1918, in an address to Congress, **3808, 3748, 1974.**

**Fourth of July,** or Independence Day, the holiday celebrating the Declaration of Independence, **1673;** fireworks, **1264–6.**

**Fowl, domestic, 2908–11.** *See also in Index* **Poultry.**

**Fox, Charles James** (1749–1806), British statesman, one of the greatest orators of his day; one of Pitt's chief rivals and opponents; dissipated, but honest and progressive in public affairs; advocated religious freedom, abolition of slave trade, electoral reform, and other liberal causes; foreign secretary 1782–83 and 1806; sympathy with Amer. colonists, **2869.**

**Fox, George** (1624–91). Eng. religious reformer, founder of the Society of Friends or "Quakers"; often imprisoned; sincere, simple, and firm.

**Fox, John, Jr.** (1863–1919). Amer. novelist, b. Bourbon County, Ky.; wrote 'The Trail of the Lonesome Pine', and other stories of the Cumberland Mts.

**Fox, Margaret** (1836–93), a leader in Spiritualist movement in U.S., **3327.**

**Fox,** an animal of the dog family (*Canidae*), **1336–7,** *pictures,* **1336, 2409;** fur, **1337, 1389, 1390, 3528;** story of Reynard the Fox, **1337–8.**

**Fox Channel,** an arm of the ocean n. of Hudson Bay and w. of Baffin Land; named after Luke Fox who in 1631 explored the region; **1690,** *map,* **602–3.**

**Foxe, John** (1516–87), Eng. author and divine; 'Book of Martyrs', **2156.**

**Foxglove,** any of several herbs with large leaves at bases and tall stems bearing spikes of bell-like flowers, **3943;** common species yields drug digitalis.

**Foxhound, 1021, 1023.**

**Fox Indians,** Algonquian tribe once dwelling in cent. Wis.; joined Sacs and moved s. and w. into Iowa; **1765, 999.**

**Fox River,** Wis., rises in s. center, flows n.e. 260 mi. through L. Winnebago to Green Bay, **3768;** explorations, **3772, 2151.**

**Fox snake,** so called from its color, also called pilot snake, **3260.**

**Fox squirrel, 3334.**

**Foxtail millet** or **foxtail grass, 2239.**

**Fox terrier, 1023.**

**Fra Angel'ico.** *See in Index* **Angelico, Fra.**

**Fractional distillation, 1014;** of petroleum, **2753–4.**

**Fractions, 1338–41;** decimal system, **971–5;** equivalents in percentages, **2724.**

**Fractures,** first aid for, **1269.**

**Fragonard** (*frä-gō-när'*), **Jean-Honoré** (1732–1806). Fr. painter of the "rococo period," whose gay delicate paintings express the frivolous luxury of Louis XV's time; decorations for pavilion for Mme. Du Barry now in Metropolitan Museum, N.Y.

**'Fram',** Nansen's ship, **2862;** used by Amundsen, **120, 2864.**

**Framework knit** fabrics, **1937.**

**Framingham,** Mass. Industrial city on Sudbury R., 20 mi. s.w. of Boston; pop. 17,033; S. Framingham business center, makes straw braids and hats, shoes, rubber goods, paper tags and labels; first state normal school in U.S.

**Frampton, Sir George James** (born 1860). One of foremost Eng. sculptors, excels in use of colored marbles and bronze in purely decorative effects; 'Socrates Teaching', Calcutta statue of Queen Victoria, sculpture on Glasgow art galleries, 'Peter Pan', Edith Cavell monument, are considered his best works.

**Franc.** A silver coin weighing 5 grams, equivalent at normal exchange to $0.193 in Amer. money; unit of monetary system in France, Belgium, Switzerland.

**France** (*frăns*), **Anatole,** pen name of Jacques Anatole Thibault (born 1844), Fr. novelist and critic, most distinguished, modern master of graceful humor and pure Fr. style; won Noble prize 1921; works placed on "Index" 1922; **1365, 1366;** story of 'Penguin Island', **2715–6.**

**France,** republic in w.-cent. Europe; 212,822 sq. mi.; pop. 41,000,000; cap. Paris; **1343–54,** *Study Outline,* **3902–3;** *maps,* **1351, 1196–7;** architecture, **1198, 1350, 181–8;** colonies, **1343, 3903;** costume, development of, **898–900;** decorations of honor, **979,** *picture,* **977;** education, **3140, 831–2, 4;** enameling, **1146;** flag, **1956;** Foreign Legion, **97;** government, **1350–1, 555;** language and literature, *see in Index* **French language, French literature;** metric system, **2206;** national debt, **2399;** national character and customs, **1350, 759, 2478–9;** national song, **2404;** painting, **2631, 2632;** religion, **1351, 2814;** sculpture, **3158;** socialism, **1347;** syndicalism, **1947.**

*Geography and industries:* agriculture, **1346–7;** Alsace-Lorraine, **102–3;** Brittany, **514–5;** buckwheat, **524;** canals, **1193, 1346, 625, 3012, 3173, 2047, 2207;** cap. Paris, **1348, 2681–5;** chief cities and manufactures, **1343, 1344, 1348** (*see also* under names of cities); climate, **1346, 1194, 3, 97, 466, 1777, 2154; 894;** fisheries, **1347, 2615–6, 3126, 502, 1048, 1285;** foreign trade, **1346, 1194, 3, 97, 466, 1777, 2154;** forests, **1343, 1327, 1903, 3662;** glove manufacture, **1475;** grape industry, **1501,** *picture,* **1350;** minerals, **1348, 1194, 103, 3662;** mountains, **1343, 1344–5, 101–2, 1903, 2940, 3662;** Normandy, **2513;** perfumes, **2728;** population, **1343–4,** *map,* **1190–1;** porcelains and pottery, **2883, 2903, 2906;** potatoes, **2900;** rainfall, *map,* **1190–1;** rivers, **1343, 1345–6, 1193** (*see also* under names of rivers); shipping, **3219;** silk, **3235, 3236;** soap, **3263;** surface, **1344–6, 1192,** *map,* **1190–1;** sugar beets, **3385;** vegetation, *map,* **1190–1.**

**France, history of:** general sketch, **1343, 1352–4, 1194–6;** chief events summarized, **1658–60;** prehistoric people and remains, **1343, 2133, 666–8, 3361, 673–4;** (for early history *see in Index* **Franks).**

*Growth of the Monarchy* (843–1483): Northmen invade, **2513, 2526;** Capetian kings and growth of royal domain, **1195, 1352, 1636, 2064–5, 2762–3;** Estates-General, **1178, 2762;** reforms of Louis IX, **2064–5;** crusades, **929–32, 2065, 2762;** feudalism, **1352, 1235–6, 1933–5;** serfdom, **3249;** monasticism, **2299;** English possessions, **1633, 3739;** Valois kings, **2763, 694–6, 2065, 1636–7, 1354;** Louis XI gains Burgundy, **697, 2065;** Hundred Years' War, **1699–1700, 694–6, 1634–5, 2763;** battle of Crécy, **1699, 635, 1552;** Agincourt, **42;** capture of Calais, **570;** war renewed by Henry V, **1634;** Joan of Arc, **1893–4, 694–6;** Black Death, **433.**

*Renaissance and religious wars* (1483–1648): invasion of Italy, **696;** Francis I, **1354, 691;** Huguenot wars, **1696, 1636–7, 826, 696, 2191, 3235;** Richelieu's policies, **3017–8, 2065;** Thirty Years' War, **3488–9, 3018, 1553;** explorations and settlements in America, **617, 2538, 2947, 2949, 3108–9;** Cartier, **651–2;** Champlain, **686–7.**

*Age of Louis XIV and the Old Régime* (1643–1789); wars of Louis XIV, **2065–6, 3741, 824–5;** War of Austrian Succession, **2147, 3180;** Seven Years' War, **2066, 1362, 1753, 3180–1,** in American Revolution, **3003, 1956, 987, 3033;** misgovernment under old régime, **1366–7, 2066.**

*French Revolution and Napoleon* (1789–1815), **1366–70, 1352, 2066–7, 2148;** Napoleon I, emperor of the French, **2391–6, 2435, 3699–3700, 3430;** Louisiana ceded to U.S.,

2072–3. *See also in Index* **French Revolution.**

*Democracy and reaction* (1815–71): Bourbons restored, **2067, 696;** Louis Philippe, **2067;** Napoleon III and the 2d Empire, **2397, 1898, 2216;** aids Italian unity, **1837, 3638;** Paris beautified, **2685;** Crimean War, **922, 3560;** Franco-Prussian War, **1355–6, 1448–9;** commune of Paris, **1356, 2685.**

*Third Republic and World War,* **1353;** Triple Entente, **1089, 1196;** colonies in Africa acquired, **40, 2327–8, 96–7, 3550;** Dreyfus case, **787;** Moroccan crises, **2327–8;** church disestablished, **2814, 787;** Clémenceau, **786–7;** Poincaré, **2851–2;** World War and peace settlement, **1353–4, 3789–3812, 3967, 3748, 1662.** *See also in Index* names of chief events and persons.

RULERS OF FRANCE

CAROLINGIAN LINE

768-814 Charlemagne
814-840 Louiś I, the Pious
840-877 Charles I, the Bald
877-879 Louis II
879-882 Louis III
879-884 Carloman
884-887 Charles II, the Fat
[888-893 Odo of Anjou]
893-922 Charles III, the Simple
[922-923 Robert I of Anjou]
[923-936 Rudolph of Burgundy]
936-954 Louis IV
954-986 Lothair
986-987 Louis V

CAPETIAN LINE

987-996 Hugh Capet
996-1031 Robert I
1031-60 Henry I
1060-1108 Philip I
1108-37 Louis VI, the Fat
1137-80 Louis VII
1180-1223 Philip II, Augustus
1223-26 Louis VIII
1226-70 Louis IX, the Saint
1270-85 Philip III
1285-1314 Philip IV
1314-16 Louis X
1316-22 Philip V
1322-28 Charles IV

VALOIS LINE

1328-50 Philip VI
1350-64 John II
1364-80 Charles V
1380-1422 Charles VI
1422-61 Charles VII
1461-83 Louis XI
1483-98 Charles VIII
1498-1515 Louis XII
1515-47 Francis I
1547-59 Henry II
1559-60 Francis II
1560-74 Charles IX
1574-89 Henry III

BOURBON LINE

1589-1610 Henry IV
1610-43 Louis XIII
1643-1715 Louis XIV
1715-74 Louis XV
1774-92 Louis XVI

THE FIRST REPUBLIC

[1792-95 The Convention]
[1795-99 The Directory]

THE CONSULATE

1799-1804 Napoleon Bonaparte, First Consul

THE FIRST EMPIRE

1804-15 Napoleon I, Emperor of the French

THE BOURBON RESTORATION

1814-24 Louis XVIII
1824-30 Charles X
1830-48 Louis Philippe

THE SECOND REPUBLIC

1848-52 Louis Napoleon

THE SECOND EMPIRE

1852-70 Louis Napoleon reigns as Napoleon III

THE THIRD REPUBLIC

1871-73 Adolphe Thiers
1873-79 Marshal MacMahon
1879-87 Jules Grévy
1887-94 M. F. Sadi-Carnot
1894-95 J. P. P. Casimir-Périer
1895-99 Félix Faure
1899-1906 Emile Loubet
1906-13 Armand Fallières
1913-20 Raymond Poincaré
1920 Paul Deschanel
1920- Alexandre Millerand

**Francesca da Rimini** (*frän-chĕs'kä dä re'mē-nē*) (died 1288?). Wife of Malatesta of Rimini who, having fallen in love with her husband's brother, was killed by her husband; story told in Dante's 'Inferno' and since by innumerable poets, painters, and dramatists.

**Franche-Comté** (*fränsh-côn-tā'*), old province in e. France, in Rhone basin, now depts. of Doubs, Haute-Saône, Jura, and part of Ain; conquered by Louis XIV in 1674, *map,* **1351;** held by duke of Burgundy, **697.**

**Franchise,** constitutional or political right of suffrage, **3384–5;** reformed in England, **2688.** *See also in Index* **Elections; Citizenship; Women's rights.**

**Franchise,** a special privilege or exemption, granted public utility companies, **2932.**

**Francia** (*fränˈchä*) (1450–1518) (real name Francesco Raibolini). Ital. painter, chief master of the Bolognese school; though deficient in composition, his pictures charm by their peaceable lyric sentiment and lovely landscapes.

**Francia, José Gaspar Rodriguez da** (1757?–1840), dictator of Paraguay (1814–40), austere, gloomy, ruthless despot, whose very name Paraguayans dared not pronounce (he was *El Supremo* during life and *El Defunto* when dead) and who for 26 years kept Paraguay a hermit nation, knowing neither want, wars, nor will of its own; described by Carlyle and by Edward L. White ('El Supremo'); **2677.**

**Francis I** (1494–1547), king of France, **1354;** and Henry VIII, **1636;** fortifies Havre, **1601;** sends colonizing expedition to Canada, **652;** a patron of art, **3644, 1198.**

**Francis II** (1543–60), France, **1354, 2158.**

**Francis I** (1708–65), Holy Roman emperor, **1355, 2147.**

**Francis II** (1768–1835), Holy Roman emperor, **1355;** resigns title, **1448;** daughter marries Napoleon, **2395.**

**Francis de Sales** (*säl*), **Saint** (1567–1622). Fr. churchman, bishop of Geneva; his book 'Introduction to the Devout Life' has been translated into almost every modern language, and is probably more widely read than any devotional work except 'Imitation of Christ'.

**Francis Ferdinand** (1864–1914), archduke of Austria; assassination, **1354, 3789.**

**Francis Joseph I** (1830–1916), emperor of Austria and king of Hungary, **1354, 273.**

**Francis of Assisi** (*äs-sē'sē*), **Saint** (1182–1226), founder of Franciscan order, **1355.**

**Francis Xavier, Saint.** *See in Index* **Xavier.**

**Francis, Sir Philip** (1740–1818), Eng. politician, reputed author of the 'Letters of Junius'; hostility to Hastings, **1596.**

**Francis'can Nuns,** or Poor Clares, **1355.**

**Franciscans, Order of,** also called Minorites, Rom. Cath. religious order founded by St. Francis of Assisi, **1355, 2302;** early missions in U.S., **2300, 580, 3121, 3478.**

**Franck** (*fränk*), **César** (1822–90), Fr. (Belgian-born) composer, "successor of Berlioz" whom he surpasses in power of invention; his music, like the man himself, sincere, straightforward, modest, combines classical and modern forms; 'Les Beatitudes', an oratorio, considered his greatest work; **2381.**

**Franco'nia** ("land of the Franks"), medieval Ger. duchy chiefly e. of Rhine in valley of Main, **1441, 1447, 1448.**

**Franconian line** of Ger. emperors, **1447, 1675.**

**Franconia Notch,** N.H., **2453.**

**Franco-Prussian War** (1870–71), **1355–6;** Ems dispatch, **427;** S. Ger. states join Prussia, **428;** siege of Metz, **2207;** battle of Rezonville, *picture,* **1352;** surrender of Sedan, **3171;** oleomargarine invented, **2577;** results, **2397, 3633, 1838.**

**Frank'enstein.** Student in Mary Shelley's novel 'Frankenstein', who fashions a soulless man monster, repulsive yet yearning for sympathy, pursuing its creator from one land to another and complaining of its loneliness.

**Frankfort,** Ind. City 40 mi. n.w. of Indianapolis; pop. 11,585; fruit, grain, and vegetable trade; r.r. shops; makes kitchen cabinets, enamel ware, cigars, clothing, brass goods.

**Frankfort,** Ky., on Kentucky R. 50 mi. e. of Louisville, in blue grass region (tobacco, live stock, horses); pop. 9805; many Civil War associations; **1918,** *pictures,* **1920.**

**Frankfort,** Mich., village on n.w. shore of lower peninsula, 25 mi. n. of Manistee; train ferry, **2967.**

**Frankfort, Diet of, 1448, 428, 1357.**

**Frankfort, Treaty of,** terminating Franco-Prussian War (1871), **1356.**

**Frankfort-on-the-Main,** Germany, in s. on Main R.; pop. 415,000; **1356–7, 1448,** *pictures,* **1447, 1478.**

**Frankfort-on-the-Oder,** Germany. Trade center 50 mi. s.e. of Berlin; pop. 65,000; on Oder R. and connected by canal with Elba and Vistula; 3 annual fairs; important mfrs. and r.r. shops.

**Frankland, Sir Edward** (1825–99). Eng. chemist and physicist, formulator of the doctrine of chemical valency and discoverer (with Lockyer) of helium.

**Franklin, Benjamin** (1706–90), Amer. scientist, statesman, and diplomat, **1357–8,** *pictures,* **1359;** colonial postmaster-general, **2896;** Albany Plan, **80, 3592;** views on Stamp Act, **3337, 1358;** on parliamentary control of colonies, **3002;** helps frame Declaration of Independence, **975, 1593;** persuades Pulaski to aid colonists, **2933;** negotiates treaty of peace with Gt. Brit., **3004;** in Constitutional Convention, **3593;** as inventor and scientist, **3368, 1621, 3310, 1959, 969;** lightning experiments, **1118, 2006–7;** "fluid" theory of electricity, **1112, 1118,** *picture,* **1119;** founds subscription library, **1992;** writings, **111, 112.**

**Franklin, Sir John** (1786–1847), Brit. admiral and Arctic explorer, discoverer of Northwest Passage; perished with all his party on Baffin Bay; **2860.**

**Franklin, Provisional District of,** Canada, **2528,** *map,* **602–3.**

**Franklin** or **Frankland, State of** (later Tennessee), **3469, 3181, 2521.**

**Franklin, battle of,** in Amer. Civil War; Federals under Schofield defeated Confederates under Hood near Franklin, town 17 mi. s. of Nashville (Nov. 30, 1864), **2398.**

**Franklin and Marshall College.** Institution for men at Lancaster, Pa., controlled by Reformed church

in the United States; formed 1852 by union of Franklin College (founded 1787) and Marshall College (founded 1835); preparatory dept., liberal arts.

**Franklin College.** At Franklin, Ind.; co-ed.; established by Baptists in 1834 but now non-sectarian; liberal arts.

**Franklin's gull,** 1550.

**Franklin stove,** 3368, 1357.

**Franks,** overrun Gaul, **1194, 1195, 1343, 1352, 674;** united by Clovis, **810;** repel barbarian invaders, **3617, 1704, 1491;** defeat Mohammedans at Tours, **697;** conquest of Ravenna, **2979;** Charlemagne rules, **688–90, 1352;** partition of Verdun, **1195, 3629;** costumes, *picture,* **898.**

**Franz** (*fränts*), **Robert** (1815–92), Ger. composer, **2381.**

**Franz Josef** (*fränts yō'zĕf*) **Land,** Arctic archipelago of about 100 small isls. n. of Nova Zembla and e. of Spitzbergen, **189, 2862.**

**Fra'ser River,** Canada, chief r. of Brit. Columbia; two forks unite near Ft. George, flowing s. 740 mi. into Strait of Georgia; gold deposits; **512, 604,** *map,* **602–3.**

**Fraternities,** college, **828.**

**Fraunhofer** (*froun'hō-fĕr*), **Joseph von** (1787–1826), Ger. optician and physicist; discovered dark lines of spectrum, **3312;** diffraction grating, **3314.**

**Fra'zer, Sir James George** (born 1854). Scotch anthropologist; principal work is 'The Golden Bough', in 12 volumes, a comparative survey of primitive religions of the world; also wrote 'Folk Lore of the Old Testament' and other books on myths and magic.

**Fréchette** (*frā-shĕt'*), **Louis Honoré** (1839–1908). Fr.-Canadian poet, generally acknowledged the greatest of his people; his lyrics are inspired by intense patriotism, love of nature, beauties of friendship and family ties ('Veronica,' a tragedy; 'Papineau' and 'Felix Poutré', historical plays).

**Frederic, Harold** (1856–98). Amer. novelist; 'Damnation of Theron Ware', brilliant analysis of religious life in the Amer. middle class; 'The Copperhead', a story of the Civil War.

**Frederick III** (1609–70). King of Denmark; he transformed Denmark into an absolute monarchy and made crown hereditary; unsuccessful wars with Sweden 1657–60.

**Frederick VI** (1768–1839). King of Denmark and Norway; succeeded 1808 (previously regent); joined Armed Neutrality of North and was punished (1801) by destruction of fleet by English (read Campbell's 'Battle of the Baltic'); suffered similarly for neutrality again in 1807; then allied self with Napoleon and was compelled by Allies (1814) to surrender Norway and Sweden as punishment.

**Frederick VII** (1808–63), Denmark. Succeeded 1848; in his reign Schleswig-Holstein troubles grew ripe for Bismarck's intervention in next reign.

**Frederick VIII** (1843–1912), Denmark, succeeded 1906; father of Haakon VII of Norway, brother of King George I of Greece and of Queen Alexandra of England; **757.**

**Frederick I, the Victorious** (1425–76). Elector palatine 1451–76; tried to dethrone Emperor Frederick III; great military leader.

**Frederick II, the Wise** (1482–1556). Elector (succeeded 1544); commanded imperial army at siege of Vienna 1529; became Protestant through influence of Melanchthon.

**Frederick III, the Pious** (1559–76). Elector (succeeded 1559); laid foundation for systematic Calvinism; aided Fr. Huguenots.

**Frederick IV, the Upright** (1574–1610). Elector (succeeded 1583), noted for firm support of Protestantism.

**Frederick V** (1596–1632), elector palatine and "winter king" of Bohemia; through his marriage with Elizabeth, daughter of James I of England, ancestor of the Windsor (Hanover) line of Eng. kings; king of Bohemia 1619–20, thereafter in exile; **3488.**

**Frederick I, Barbarossa** (1123?–90), Holy Roman emperor, "in many respects the ideal emperor of the Middle Ages," **1358, 834;** leads 3d Crusade, **930;** opens Charlemagne's tomb, **1;** charters Univ. of Bologna, **832.**

**Frederick II** (1194–1250), Holy Roman emperor, **1358, 1360;** develops Sicily, **2391, 3230;** secures Jerusalem, **932.**

**Frederick III** (1415–93), Holy Roman emperor, **1360, 273.**

**Frederick I** (1657–1713), first king of Prussia (1701), previously elector of Brandenburg (1688–1701), and duke of Prussia; patron of learned men, but vain and extravagant; gained title of king for aiding Emperor Leopold I in War of Spanish Succession; **2929.**

**Frederick II, the Great** (1712–86), Prussia, **1360–1, 1448, 2929;** Carlyle's biography, **645;** develops army, **218;** Ger. literature in his reign, **1436, 1448;** partition of Poland, **2856;** in Seven Years' War, **2147, 3180;** and Voltaire, **1360, 3661.**

**Frederick III** (1831–88), Ger. emperor and king of Prussia (March 9 to June 15, 1888); son of William I, first Ger. emperor; father of William II; commanded at Sedan and siege of Paris in Franco-Prussian War; liberal, cultured, friend of parliamentary govt.; died of cancer; **3738.**

**Frederick III, the Wise** (1463–1525), elector and duke of Saxony; refused imperial throne 1519 and suggested election of Charles V; friend of Luther and Melanchthon, whom he invited to teach at Univ. of Wittenberg founded by him; **3132, 2987.**

**Frederick Henry** (1584–1647). Prince of Orange; youngest son of William the Silent and brother of Maurice of Nassau; ended the 80-year struggle with Spain by the treaty of Munster (1648); his term as stadholder (1625–47) is accounted the golden age of the Dutch Republic.

**Frederick William** (1620–88), the "Great Elector" of Brandenburg and duke of Prussia; succeeded 1640; laid foundation for greatness of Prussia, previously ruined by Thirty Years' War; **2929.**

**Frederick William** (born 1882), crown prince of Prussia, abdicated 1918; commander of Fifth Ger. army in World War, **3805;** at Verdun, **3628–9, 3794.**

**Frederick William I** (1688–1740), king of Prussia; succeeded 1713; eccentric, parsimonious but able administrator; real founder of modern Prussia; left Prussia world's third military power and on sound financial basis; trains Frederick the Great, **1360.**

**Frederick William III** (1770–1840), king of Prussia; succeeded 1797; good, weak man under whom Prussia was almost effaced by Napoleon, but restored by Congress of Vienna and rehabilitated by the great ministers Stein and Hardenberg; member of Holy Alliance; his queen, Louisa, a heroine of modern Germany; founds Univ. of Bonn, **454.**

**Frederick William IV** (1795–1861), king of Prussia; succeeded 1840; reactionary idealist; reluctantly granted Prussian constitution following revolutionary uprisings of 1848; refused imperial German crown, **1448;** regency, **3737.**

**Frederick,** Md. City 44 mi. n.w. of Baltimore, makes iron and steel, clothing, brushes, brick; pop. 11,066; scene of Whittier's 'Barbara Frietchie'; home and burial place of Francis Scott Key.

**Fred'ericksburg,** Va. City 60 mi. n. of Richmond, on Rappahannock R. at head of tidewater; pop. 5882; national and Confederate cemeteries; Presb. college, state normal school, various mfrs.; strategic point in Civil War.

**Fredericksburg, battle of, 1361, 1571.**

**Fredericton,** New Brunswick, cap. and r.r. center on St. John R.; pop. 8500; makes shoepacks, shoes, boats, lumber, cotton; coal-mining; provincial univ.; **2449.**

**Frederikshald,** Norway. Fortified seaport on Idde Fiord; pop. 12,000; timber trade; Charles XII of Sweden was killed here during siege in 1718.

**Frederikstad,** Norway. Seaport and mfg. town at mouth of R. Glommen, 50 mi. s.e. of Christiania; pop. 16,000; export lumber trade; Hankö, most fashionable Norwegian resort, near by.

**Fredo'nia,** N.Y., village 45 mi. s.w. of Buffalo; pop. 6051; center of grape-growing section; natural gas, **1407.**

**Free city,** city with an independent govt.; applied especially to Ger. free cities; Bremen, **502;** Danzig, **962;** Fiume, **1286;** Hamburg, **1567–8.**

**Freedmen's Bureau,** established by U.S. at close of Civil War for guardianship and education of emancipated negroes, **780, 2435;** bill passed over Johnson's veto, **1897.**

**Freedom of the press, 2918, 393;** Milton's 'Areopagitica', **2242;** Zenger's trial, **2497.**

**Freedom of the seas,** in international law, **1794;** in World War armistice terms, **3748, 3808.**

**Freeman, Edward Augustus** (1823–93), Eng. historian, exceedingly careful and impartial but prolix ('History of the Norman Conquest'); quoted, **1536, 1654.**

**Freeman, Mary Wilkins** (born 1862). Amer. short-story writer and novelist, natural romanticist, realist by effort; portrays repressed passions of New Englanders ('A New England Nun'; 'The Wind in the Rose Bush'; 'The Fair Lavinia'; 'Butterfly House').

**Freemasons,** a secret fraternity. **1361.**

**Freeport,** Ill., city in n.w., 105 mi. n.w. of Chicago; pop. 19,669; automobiles, gas engines, iron and steel products, patent medicines, organs; scene of Lincoln-Douglas debate, **2017.**

**Freeport Doctrine, 2017.**

**Free ports,** ports or specified areas within ports wherein imported goods may be stored, transferred from ship to ship, or used in manufacturing for export sale, without levy of customs duties; duties are levied upon goods sent from the "free area" to interior points; Copenhagen an example, **880.**

**Free silver.** *See in Index* **Silver, free coinage of.**

**Free-Soil party,** in U.S., **2870, 2871;** elects Sumner to Senate, **3392;** presidential candidates, **522, 3617.**
**Freetown.** Seaport of w. Africa, cap. of Brit. colony of Sierra Leone; pop. 34,000; military station; exports rubber, palm oil, gums, nuts, ginger.
**Free trade, 3437;** in Gt. Brit., **3437, 1155, 2706.**
**Free verse, 2851, 117;** Whitman, **3734.**
**Freezing, 1361–2, 1720, 3262, 3693, 3696,** *picture,* **1618.**
**Freezing points,** table, **1362.**
**Freiberg** (*frī'bĕrĸ*), Germany. Mining town in Saxony, 25 mi. s.w. of Dresden; pop. 33,000; famous mining academy; silver and lead.
**Freight rates, 2971;** marine, **853.**
**Freight trains, 2966, 2970, 2971.**
**Freight vessels, 3218, 853, 1513,** *pictures,* **1512.**
**Frelinghuysen** (*frē'lĭng-hī-zĕn*), **Theodore** (1787–1862), Amer. statesman and educator, b. Millstone, N.J.; U.S. senator 1829–35; defeated for vice-president, **2872.**
**Frémiet** (*frā-myā'*), **Emmanuel** (1824–1910), Fr. sculptor noted for animal studies, **3158.**
**Fremont', John Charles** (1813–90), Amer. general and explorer, b. Savannah, Ga.; demonstrated the practicability of a route over the Rocky Mts.; made first scientific exploration of Pacific coast; explorations, **2447, 844, 650, 3822, 581;** defeated for president, **522.**
**Fremont,** Neb., city 30 mi. n.w. of Omaha; pop. 9605; dairying and live stock interests; **2432.**
**Fremont,** Ohio. City 30 mi. s.e. of Toledo on Sandusky R.; pop. 12,468; cutlery, steel and brass castings, automobiles and accessories, boilers, beet-sugar; home of Pres. Hayes.
**Fremont Peak,** in Wind River Mts., Wyo., **3036.**
**Fremstad** (*frĕm'stät*), **Olive** (born 1870). Amer. operatic soprano and lieder singer; b. Sweden; noted for Wagnerian rôles ('Isolde'; 'Brunnhilde'; 'Kundry').
**French, Alice.** *See in Index* **Thanet, Octave.**
**French, Daniel C.** (born 1850), Amer. sculptor, b. Exeter, N.H., **3164;** most famous statue 'The Minute Man', **1990.**
**French, John D. P., Earl** (born 1852), Brit. field marshal; commander of Brit. forces in Belgium and France 1914–15; commander-in-chief of forces in the United Kingdom 1915–18; lord-lieut. of Ireland 1918–21; at first battle of Marne, **2151.**
**French Academy, 4, 1364.**
**French and Indian War** (1754–63), **1362, 3180;** Chatham, **700;** effect on Brit. colonial policy, **3000;** Indians' part in, **1772, 2486;** Montcalm, **2312;** Wolfe, **3775;** Washington in, **3676.**
**French Broad River,** rises in Blue Ridge of w. N.C., and flows w. 250 mi. into Tenn., **3466.**
**French-Canadians, 610, 2945, 2946, 2947;** culture, **2948, 2949;** depicted by W. H. Drummond, **1042–3;** in Mass., **2166.**
**French chalk,** a kind of talc, **685, 3430.**
**French Congo,** Africa. *See in Index* **French Equatorial Africa.**
**French East India Company, 1072–3.**
**French Equatorial Africa** (French Congo), Fr. colony in w.-cent. Africa; includes most of former Ger. colony of Cameroon; 1,037,131 sq. mi.; pop. 9,000,000; cabinet woods, palm oil, rubber, ivory; *map,* **40–1.**
**French Guiana,** Fr. colony on n.e. coast of S. Amer.; 32.000 sq. mi.; pop. 30,000; cap. Cayenne; **1547,** *map,* **3288–9.**
**French Guinea** (*gĭn'ē*), colony forming part of Fr. W. Africa, on coast between Port. Guinea and Brit. colony of Sierra Leone; 95,218 sq. mi.; pop, 1,850,000; cap. Konakry; *map,* **40–1.**
**French horn,** a musical instrument, **1680, 1681, 2591.**
**French India.** Five Fr. dependencies in India (Pondicherry, Karikal, Chandernagore, Mahé, and Yanaon); total pop. 270,000; 196 sq. mi.
**French Indo-China,** Fr. possession in s.e. Asia; 256,000 sq. mi.; pop. 17,000,000; **1777,** *map,* **232–3.**
**French language, 1363–4;** beginnings, **3040, 1363, 1965;** influence on Eng. language, **1162;** number of people speaking, **2772;** in Switzerland, **3415;** Walloon dialect, **376.**
**French Lick Springs,** Ind., saline-sulphur springs in s.w. near village of French Lick, 65 mi. n.e. of Evansville; noted health and pleasure resort; **1760, 3331.**
**French literature, 1363–6, 4003;** chief writers and their works, **1365–6;** drama, **1034, 1036, 1038, 891, 2279;** early romances, **3039, 3038;** French Academy, **4, 1364;** naturalist school, **3840;** novel, **2541;** romantic revolt led by Hugo, **1694.**
**French Revolution** (1789–95), **1366–70, 2066–7, 1352;** Burke's opposition, **540;** Carlyle's history, **644, 645;** conscription, **218;** Danton, **961;** Declaration of Rights of Man, **1368, 393, 3778;** effects in Europe, **1196, 1353;** encyclopedists, **1367, 1365;** meeting of Estates-General, **1179, 1367;** Jacobins, **1859, 2259;** Lafayette in, **1956;** Lavoisier beheaded, **1249;** Marie Antoinette, **2148;** the 'Marseillaise', **2404;** Mirabeau, **2259;** Thomas Paine, **2626;** paper money, **2282, 1368;** Reign of Terror, **1370;** Robespierre, **3027–8;** Madame Roland executed, **3039;** Rousseau's influence, **3071;** sans culottes, **900;** serfdom ended, **3249;** Talleyrand, **3430;** Voltaire's influence, **3661;** X Y Z Affair, **3826.**
**French Soma'li Coast,** colony in n.e. Africa bordering Gulf of Aden; 5790 sq. mi.; pop. 208,000; chief town Jibuti (Djibouti); **41, 37,** *maps,* **40–1.**
**Frenchtown,** former village on site of present Monroe, Mich., on Raisin R. 35 mi. s.w. of Detroit; Amer. defeat by British and Indians 1813, followed by massacre of wounded Americans (Raisin River Massacre), **3672.**
**French West Africa,** collective name for w. Sahara and adjacent coastal colonies; 1,800,600 sq. mi.; pop. 11,465,000; *maps,* **40–1.**
**Freneau** (*frē-nō'*), **Philip** (1752–1832), early Amer. poet; edited anti-Federalist *National Gazette,* Philadelphia (1791–93); 'The British Prison Ship; 'Eutaw Springs'; **112.**
**Frens'sen, Gustav** (born 1853). Ger. novelist; 'Jörn Uhl', strong novel of peasant life, made him famous; 'Peter Moors' Journey to Southwest Africa' includes pictures of life in Ger. African colonies.
**Frere** (*frēr*), **Sir (Henry) Bartle** (1815–84). Eng. administrator, nephew of John Hookham Frere; gov. of Bombay 1862–67; as special commissioner to East Africa influential in abolishing slave trade in Zanzibar; as gov. of Cape Colony 1877–80 attempted confederation of South Africa.
**Frere, John Hookham** (1769–1846). Eng. diplomat and author, minister to Portugal 1800–02, to Spain 1802–04 and 1808; his spirited verse translations of Aristophanes' plays remain unrivaled.
**Fres'co,** method of painting on fresh plaster, **2629.**
**Fresh-water clam,** a mussel, **783.**
**Fresnel** (*frā-nĕl'*), **Augustin Jean** (1788–1827). Fr. physicist; demonstrated (after Young but independently) wave theory of light; contributed theory that light waves are transverse; changed mode of lighthouse illumination over whole world ("Fresnel system").
**Fres'no,** Calif. City 162 mi. s.e. of San Francisco; pop. 45,086; center of dried fruit industry and shipping point for fresh fruit; large petroleum interests.
**Freud** (*froid*), **Sigmund** (born 1856) Austrian neurologist and psychiatrist; made psycho-analysis, especially analysis of dreams, important factor in diagnosing mental conditions. *See also in Index* **Psycho-analysis.**
**Frey** (*frā*). In Norse myth., god of peace, prosperity, and fruitfulness, brother of Freyja.
**Freyja** (*frā'ȧ*), **Freyia,** or **Freya.** In Norse myth., goddess of love, often confused with Frigg.
**Freytag** (*frī'täĸ*), **Gustav** (1816–95). Ger. novelist and playwright; influenced by Scott and Dickens; his novels impressive by their sturdy realism, with strong undercurrent of patriotism; chief works, **1438.**
**Friars,** distinguished from monks, **2300;** chief orders, **2300, 2302.**
**Frick, Henry C.** (1849–1919). Amer. capitalist and steel mfr., b. West Overton, Pa.; early obtained control of most of Connelsville coal lands; entered Carnegie Steel Company (1882), becoming rival of Carnegie for control and one of wealthiest men of country, leaving fortune of $100,000,000.
**Friction, 1370;** creates electricity, **1108,** *picture-diagram,* **1111;** experiments, **1110;** produces heat, **1618, 1619, 99;** in starting fire, **1249, 2170,** *pictures,* **1251.**
**Frictional electricity, 1108, 1110–12,** *picture,* **1111.**
**Friday,** in Defoe's 'Robinson Crusoe', savage rescued from cannibals by Crusoe, later his servant, **933, 934.**
**Friday,** sixth day of week; meaning of name, **969;** Good Friday, **1070;** Mohammedan Sabbath, **3103.**
**Frideswide** (*frĕ'dĕs-wi-dē*), **Frithes-with,** or **Fredeswitha** (8th cent.), Eng. saint, **2608.**
**Fried'land** (*frēt'länt*), Germany. Town in E. Prussia, on Alle R., 27 mi. s.e. of Königsberg; battle of Friedland 1807.
**Friedland, battle of, 2394;** Ney at, **2500.**
**Friendly Islands.** Same as **Tonga Islands.**
**Friends,** religious sect founded in England about 1650 by George Fox; called Quakers, originally in derision; among earliest opponents of human slavery; war they consider opposed to spirit of Christ; refuse to swear oaths; Bunyan opposes, **534;** hats. **1598;** found Pennsylvania, **2716–7, 2721–2;** numerical rank, **2994;** oppose slave trade, **3736;** prison reforms in U.S., **2920.**
**'Friendship',** a Little Talk by Arthur Mee, **1371.**
**Friends University.** At Wichita, Kan.; co-ed.; opened 1898 (chartered 1891); Society of Friends; collegiate, normal, commercial, musical, biblical courses.
**Fries** (*frēs*), **John** (1764–1825), Amer. insurgent, leader of "Fries' Rebellion" in Pa., 1799, revolt against a direct tax levied by Congress, **14.**

**Friesian** (*frē'zhăn*) or **Frisian Islands,** chain in North Sea off Dutch coast; from Zuider Zee e. and n. as far as Jutland; 400 sq. mi.; *map,* **373.**
**Friesians** or **Frisians, 1194, 1446.**
**Friesland** (*frēz'lănd*) or **Vriesland,** n.w. province of Netherlands, surface partly below sea-level, protected by dikes; 1243 sq. mi.; pop. 385,000; horses and cattle.
**Frietchie, Barbara,** aged heroine of Whittier's poem who defiantly waves Stars and Stripes from her window as Stonewall Jackson's men march through Frederick, Md., **3737, 781.**
**Frieze** (*frēz*), in architecture, *picture,* **180;** of Parthenon, **11–12,** *picture,* **176–7.**
**'Frieze of the Prophets',** *picture,* **2923.**
**Frigate-bird, 1372, 413.**
**Frigg** (*frĭg*), **Frig'ga,** or **Friia,** in Norse myth., wife of Odin and greatest of goddesses, **3135;** mother of Balder, **306;** Friday named for, **969.**
**Frijole** (*frē-hō'lē*), Mexican bean, **2213, 347.**
**Frill-back,** a pigeon, **2804.**
**Frilled lizard, 2036,** *pictures,* **2035, 2037.**
**Fringil'lidae.** *See in Index* **Finch family.**
**Fringing reefs, 886.**
**Frisians.** Same as **Friesians.**
**Frobisher** (*frŏb'ĭsh-ẽr*), **Sir Martin** (1535?–94), Brit. navigator and naval hero, first to seek the Northwest Passage; made 3 voyages to Labrador; **2860.**
**Frobisher Bay,** inlet of Davis Strait opening westward at s. end of Baffin Land, **2860.**
**Froebel** (*frû'bĕl*), **Friedrich Wilhelm** (1782–1852), Ger. educator, founder of kindergarten, **1372, 1923–5, 3655.**
**Frog, 1373–5,** *picture,* **2409;** eggs, *picture,* **1091;** evolutionary position, *diagram,* **128,** *picture,* **129;** eye, *picture,* **1215;** foot, *picture,* **1323;** hibernation, **1646;** "intelligence" in, **131.**
**Frog'bit,** a water plant; getting ready for winter, *picture,* **2825.**
**Frog-fish, 1276–7,** *picture,* **1273.**
**"Frog in the Middle,"** game, **2836.**
**Frog'more,** royal mansion 1 mi. s.e. of Windsor Castle, **3752.**
**Frog shell, 3201,** *picture,* **3203.**
**Froissart** (*frwä-sär'*), **Jean** (1337–1410?), Fr. chronicler and poet, **1375, 1364;** battle of Crécy, **1699.**
**Frome River,** in England, flowing 20 mi. into Avon, **510.**
**Fronde** (*frôńd*), **The.** A civil war in France during minority of Louis XIV (1649–52) and the consequent war with Spain (1653–59), so called (*fronde,* "sling") from free use of slingshots by the Paris mob; its suppression contributed to the growth of absolutism under Louis.
**Fronds,** leaves of ferns, **1232, 1234.**
**Frontenac** (*frôń'tē-năk*), **Count Louis de** (1620–98), gov. of New France, **1375, 1900, 1926.**
**Front Range Mts.,** Colo., most easterly range of Rockies; contains Pikes Peak and Longs Peak, **3036.**
**Front Royal,** Va. Town, cap. of Warren County, 105 mi. n.w. of Richmond; "Stonewall" Jackson defeated Col. Kenly, May 1862.
**Frost, Robert** (born 1875), Amer. poet, b. San Francisco; excels in affectionate rendering of the spare, austere New England spirit ('A Boy's Will'; 'North of Boston'); **117, 56–7.**
**Frost, 1375–6;** how orange-growers fight it, **1380, 2588.**
**Frost bites,** treatment of, **1270.**
**Frosted vanilla, 3619.**
**Froude** (*frŭd*), **James Anthony** (1818–94). Eng. historian, often prejudiced but a master of Eng. style ('History of England from the Fall of Wolsey to the Death of Elizabeth'; 'Reminiscences of Thomas Carlyle').
**Fructose,** or fruit sugar, **3388.**
**Fruit** (in botany), the matured seed-container of a flowering plant, **1380;** of water-plants, **3700;** why many fruits are edible, **3172–3, 2827.**
**Fruits and fruit growing, 1377–80;** Asiatic origin of stone-fruit trees, **232;** blight, **436;** canning, **631–3;** cicada pest, **765;** clover as cover-crop, **810;** codlin moth, **820;** cold storage, **825;** dehydration, **986–7;** food value, **1320, 1321;** grafting, **1377,** *pictures,* **1379;** introduced into Europe by Crusaders, **932;** mildews and molds, **2235–6;** pollination by bees, **362;** preventing damage by birds, **403;** producing new varieties, **1377, 538–9;** protection against frost, **2588, 1376, 1380;** rusts and smuts, **3099–3101;** scale parasites, **3132–3;** sprays and spraying, **3330–1;** U.S. industry, **3588, 1379.** *See also in Index* names of chief fruits and fruit-growing regions.
**Fru'menty,** an old breakfast dish, **501.**
**Fry, Elizabeth Gurney** (1780–1845), Eng. Quakeress, prison reformer, **2920.**
**Fry, Roger E.** (born 1866), Eng. painter of ultra-modern tendencies, **2633, 2634.**
**Fry'att, Charles** (1872–1916), Eng. captain of a Brit. merchant ship, court-martialed and shot by Germany on charge of having tried to ram a submarine, **3798.**
**Frying, 877.**
**Fuad** (*fụ-äd'*) **I, Ahmed Ali Pasha** (born 1868). King of Egypt; became sultan 1917, proclaimed king 1922, upon removal of Brit. protectorate.
**Fuca** (*fụ'kä*), **Juan de** (d. 1602), Gk. navigator whose real name was Apostolos Valerianos; served in Span. navy; explored n.w. coast of N. Amer.; in Puget Sound, **2596.**
**Fuchow,** China. Same as **Foochow.**
**Fuchsia** (*fū'shà*), an ornamental plant, **1381.**
**Fu'el,** alcohol, **84;** charcoal, **688;** coal, **811–4, 3214;** coal gas, **1406–7;** coal-tar pitch, **814;** coke, **824;** combustion, **1249–50;** consists of carbon forms, **642;** how it produces heat, **1619;** natural gas, **1407–8;** oil, **2753, 2754, 2755, 3214;** peat, **2704–5;** smoke, **3253–4.**
**Fuel values,** of food, **1320, 1321, 1322, 2926.**
**Fuenterrabia** (*fwĕn-tĕr-rä-bē'ä*) or **Fontara'bia,** Spain. Town on Fr. frontier, on R. Bidassoa; famous fortress destroyed by French 1794; Wellington crossed Bidassoa in spite of opposition 1813.
**Fuerte** (*fwĕr'tā*), r. in w. Mexico; 180 mi. to Gulf of California; *map,* **2209.**
**Fugger** (*fụg'ẽr*), wealthy family of Ger. merchants and bankers, famous in 16th cent.; founded by Johann Fugger, Bavarian weaver in 14th cent.; Charles V and, **1442.**
**Fugitive slave laws,** in U.S., **3249, 1240;** Dred Scott decision, **1039, 522.**
**Fujiyama** (*fụ-jē-yä'mä*), **Fuji-no-Yama,** or **Fuji-San,** sacred mt. of Japan, 70 mi. s.w. of Tokyo; 12,365 ft. high; **1863,** *picture,* **1866.**
**Fukien** (*fụ'kĭ-ĕn*) or **Fokien,** China, maritime province in s.e.; 46,332 sq. mi.; pop. 13,000,000; cap. Foochow; **1319.**
**Ful'crum,** fixed point about which lever moves, **2188.**
**Fulda** (*fụl'dà*), **Ludwig** (born 1862), Ger. dramatist; wrote 'The Talisman', 'The Lost Paradise'; translated works of Molière, Beaumarchais, and Rostand; **1892.**
**Fulda,** Germany. Town in Prussia, 55 mi. n.e. of Frankfort, famous in Middle Ages for Benedictine abbey; pop. 22,000; cattle market; r.r. shops.
**Fuller, George** (1822–84). Amer. painter, poetic dreamer and idealist, b. Deerfield, Mass. ('The Romany Girl'; 'The Turkey Pasture').
**Fuller, Margaret** (Marchioness Ossoli) (1810–50), Amer. writer, b. Cambridgeport, Mass.; remembered chiefly for her association with the Transcendentalists and Emerson; married in Italy; entered the struggle for Ital. independence; drowned at sea; friend of Hawthorne, **1607.**
**Fuller, Melville Weston** (1833–1910). Amer. jurist, b. Augusta, Me.; chief justice U.S. Supreme Court 1888–1910; decisions aided growth of federal power.
**Fuller, Thomas** (1608–61). Eng. clergyman and writer; style vigorous and full of humor; chaplain to Charles II ('History of the Worthies of England').
**Fuller, Thomas** (1823–99), Canadian architect, b. in England; designed N.Y. capitol, *picture,* **2482.**
**Fuller's earth,** a clay-like substance used in cleansing cloth and wool of grease, and in clarifying oil; in Fla., **1298.**
**Fulling** or **milling,** a process in the manufacture of woolen cloth, **3787.**
**Full moon, 2318.**
**Ful'mar,** a sea-bird, **2747.**
**Ful'minate,** a highly explosive salt of fulminic acid, **1254;** mercury, **1211;** silver, **3242.**
**Ful'ton, Robert** (1765–1815), Amer. inventor of steamboat, **1381, 1797, 1221;** and Cartwright, **652;** steamboat *Clermont,* **3212, 1381;** invents submarine, **3378.**
**Fulton,** N.Y. Industrial city 24 mi. n.w. of Syracuse on Oswego R. and Canal; pop. 13,043; center of cheese trade; makes paper, woolen goods, flour, firearms.
**Fumiga'tion, 151;** formaldehyde, **1331;** hydrocyanic acid, **944;** sulphur dioxide, **3390.**
**Funchal** (*fụn-shäl'*), capital of Madeira; pop. 25,000; picturesque and well built, with narrow steep streets; sugar plantations and vineyards; **2106.**
**Fundamen'tal,** in music, **3278.**
**Fun'dy, Bay of,** large inlet of Atlantic between New Brunswick and Nova Scotia; remarkable for high tides, **3497, 3107, 2538,** *picture,* **3498;** *map,* **602–3.**
**Fü'nen,** largest of Danish isls. after Zealand; 1133 sq. mi.; pop. 252,000; with adjacent isls. forms province of Fünen; cap. Odense; **996,** *map,* **997.**
**Fünfkirchen** (*fünf'kĭrĸ-ĕn*), Hungary. Same as **Pécs.**
**Fungi** (*fŭn'ji*), primitive colorless plants, **1382, 3938;** and algae, **92, 1994, 2680;** *pictures,* **1382, 2235, 2374–5, 2408, 2821, 3100;** attack hollyhock, **1674;** mildews and molds, **2235–6;** mushrooms, **2374–5;** nitrifying species necessary to blueberries, **439;** parasitic and saprophytic, **2823, 2680, 2825;** relation to other life, **394;** rusts and smuts, **3099–3101;** spraying kills, **3330–1;** yeasts, **3828.**
**Fun'gicide, 3330, 3331.**
**Funk, Isaac K.** (1839–1912). Amer. Lutheran clergyman, publisher, editor; edited *Literary Digest* and 'Standard Dictionary'.
**Funny bone.** Really not a bone, but the ulnar nerve, which is only slightly protected at the elbow;

pressure or blow on this nerve causes sharp pain.

**Pun'ston, Frederick** (1865–1917). Amer. general, b. New Carlisle, Ohio; captured Aguinaldo 1901; administered martial law in San Francisco during the earthquake and fire 1906; commanded Amer. forces in Vera Cruz 1914.

**Fur-farming, 1389,** in Canada, **610.**

**Furies** or **Eumenides,** in Gk. and Rom. myth., goddesses who punished crime. **1382.**

**Fur'long,** a unit of measure, **3715;** origin, **3714.**

**Furnace,** for heating houses, **1622.**

**Furnace, industrial, 1382–3;** blast, **1820,** *picture,* **1817,** *picture-diagrams,* **1818–9;** electric, **1382–3, 3234, 2777;** in glass-making, **1471,** *picture,* **1473;** lined with carborundum, **3234;** open-hearth, **1826,** *picture,* **1821;** reverberatory, **1824,** *picture-diagram,* **883;** roasting, *picture-diagram,* **883.**

**Fur'ness,** England. District of n.w. Lancashire, peninsula across Morecambe Bay from rest of county; hematite iron ore; ruins of famous abbey.

**Fur'niss, Harry** (born 1854). Irish caricaturist, author, lecturer; for many years on staff of *Punch,* to which he contributed 'Diary of Toby, M.P.'; illustrated works of Dickens and Thackeray, A'Beckett's 'Comic Blackstone'; wrote and illustrated 'Confessions of a Caricaturist' and other books; a draftsman of power and versatility.

**Furniture, 1383–8;** history, **1383–5;** influence of Morris, **2329;** modern methods of manufacture, *pictures,* **1386–8;** U.S. centers of manufacture, **1497, 721;** veneer, **3620.**

**Fur'nivall, Frederick James** (1825–1910). Eng. philologist; founded Early English Text Society, Chaucer Society, and other societies for publication of texts; edited 'Six-Text Print of Chaucer's Canterbury Tales'; supervised publication of 43 facsimiles of quartos of Shakespeare's plays.

**Furs and fur trade, 1389;** in Canada, **610, 83, 2137, 1690, 1692, 1948;** chief kinds, table, **1390;** felt-making, **1597,** *picture,* **1599;** importance in settlement of N. Amer., **3582, 1389;** St. Louis market, **3109;** Siberia, **3228;** trapping, **3527–9.** *See also in Index* names of principal fur-bearing animals.

**Fur seal, 3166, 3167, 3168.**

**Fury and Hec'la Strait,** narrow channel in Arctic N. Amer. between Cockburn Land and Melville Peninsula, and connecting the Gulf of Boothia with Fox Channel, **1690.**

**Fusan** (*fu̯-sän'*). Chief seaport of Korea, in s.e.; opened to foreign trade 1876; pop. 30,000.

**Fuse,** wire which melts when overloaded with electric current, **1114,** *pictures,* **1116.**

**Fuselage** (*fū'sĕ-läğ*), of airplane, **65.**

**Fu'sel-oil.** A poisonous liquid formed in fermentation; used in paints and varnishes.

**Füssen** (*füs'sĕn*), Germany. Historic town 58 mi. s.w. of Munich; peace signed here between Elector Maximilian III, Joseph of Bavaria, and Maria Theresa, 1745.

**Fust** or **Faust, Johann** (died 1466?), Ger. money-lender, associated with Gutenberg in invention of printing, **2916,** *picture,* **2917.**

**Fus'tian,** a cotton cloth, **804.**

**Fus'tic,** a yellow dye, **1050.**

**Futures, dealing in,** on grain exchange, **441.**

**Fu'turists,** in painting, **2633–4;** in sculpture, **3164.**

**Fyles, Franklin,** composer of tune of 'Hail Columbia', **2405.**

# G

OUR capital G is made from the Latin C, which as we have learned is a rounded form of the Greek *Gamma*. Until the middle of the 3d century B.C. the letter C was used in Latin inscriptions to denote both the *c* and *g* sounds, and throughout the whole of Roman history C remained as the symbol for G in the abbreviations C. and Cn. for "Gaius" and "Gnaeus." But on account of the inconvenience of not being able to distinguish between the two sounds of the character C, a slight modification was made for the *g* sound. The new letter G occurs in a famous epitaph on Scipio Barbatus, who was consul in 298 B.C. The monument on which his epitaph appears is one of the treasures of the Vatican. Plutarch says that the new symbol was invented by Spurius Carvilius Ruga, who spelled his family name R V G A instead of R V C A (the V still being used on stone inscriptions and wax tablets for the sound which we represent by U). At first the capital G was so much like C that you could hardly tell the difference, the lower lip of the crescent merely rising up in a straight line. In a later form this was curved inward, and in another form it had a sort of "goatee" added, which in time became the little cross-bar of the G we know. In modern English G has two chief sounds: "hard," as in *go, gave, glad,* and "soft," as in *gem, gentle, age.*

**Gabelle** (*gȧ-bĕl'*), a tax, **1366.**

**Gabet'ti, G.,** Ital. composer, **2405.**

**Gabii** (*gā'bĭ-ī*), anc. city of Latium, 12 mi. e. of Rome; captured by Tarquinius Superbus; excavations have yielded notable works of art; 'Artemis of Gabii', *picture,* **1203.**

**Gabin'ius, Aulus** (d. 47? B.C.). Rom. politician; as tribune 66 B.C. carried Gabinian law giving Pompey supreme command in Mediterranean; consul 58 B.C.; proconsul in Syria 55 B.C.; banished for extortion though defended by Cicero, whom he had exiled while consul.

**Gaboriau** (*gȧ-bō-rĭ-ō'*), **Emile** (1833–73). Fr. writer of detective stories; among the best are 'Monsieur Lecoq', 'The Slaves of Paris', 'Other People's Money'.

**Gabriel** (*gā'brĭ-ĕl*), archangel and heavenly messenger, sent to the Virgin Mary (Luke i, 19, 26), the prophet Daniel and others; recognized by Mohammedans as well as Christians and Jews; **2008, 2245.**

**Gabrilowitch** (*gȧ-brĕ'lō-vĭch*), **Ossip** (born 1878). Rus.-Amer. pianist and conductor, b. Petrograd, Russia; married Clara Clemens, daughter of "Mark Twain"; conductor Detroit Symphony Orchestra.

**Gad.** Son of Jacob; ancestor of tribe of Gad.

**Gad'di.** Family of Florentine painters, of whom most important was Taddeo (1300?–66); he was most talented pupil of Giotto, but inferior in character and expression to his master; said to have continued Giotto's work on Florence campanile and to have built the Ponte Vecchio.

**Gade** (*gā'dē*), **Niels Wilhelm** (1817–90). Leading Danish Romanticist composer; his music is lyrical and highly polished; wrote symphonies, overtures, suites, and songs. 'Erl King's Daughter', 'The Springtide Phantasy', 'The Crusaders', for voice with orchestra, are among his most popular works.

**"Gadfly of Athens," 3270.**

**Gadir,** anc. name of Cadiz, Spain, **3302.**

**Gadolin'ium,** a rare metallic element, **4042.**

**Gads'den, James** (1788–1858). Amer. diplomat, b. Charleston, S.C.; as minister to Mexico, negotiated the Gadsden Purchase (1853).

**Gadsden,** Ala. Mfg. city on Coosa R. 56 mi. n.e. of Birmingham near Lookout Mt.; pop. 14,737; coal and iron and timber region; iron and steel and lumber products.

**Gadsden Purchase,** territory s. of Gila R. in Ariz. and N.M., bought by U.S. from Mexico in 1853; **3604, 2802,** *map,* **3605.**

**Gadski** (*gȧt'skē*), **Johanna** (born 1871). Ger. soprano, great Wagnerian interpreter; became member Metropolitan Opera Co. 1898; retired from stage 1917.

**Gaea** (*ję'ȧ*) or **Ge,** in Gk. myth., the anc. goddess "Mother Earth," **3607;** intercedes for Daphne, **962;** mother of Antaeus, **1640.**

**Gaelic** (*gāl'ĭk*), anc. language of Ireland and Scotland, **1814, 674.**

**Gaelic League,** in Ireland, **1814.**

**Gaeta** (*gā-ā'tä*), Italy. Strongly fortified seaport 45 mi. n.w. of Naples; refuge of Pope Pius IX when he fled (1848–50) from Rome; Francis II of Naples surrendered to Garibaldi 1861 after long siege.

**Gaff,** of ship, *diagram,* **3209.**

**Gage, Thomas** (1721–87), Brit. general, gov. of Mass. and military commander-in-chief in America at outbreak of Amer. Rev.; superseded by Howe after Bunker Hill; **1990, 16.**

**Gage plum, 2840.**

**Gag rule,** certain rules, passed by Congress in 1835 and 1837, which provided that all petitions relating to abolition of slavery should virtually be disregarded and should be laid on the table without action; opposed by John Quincy Adams, **15–16.**

**Gaheris** (*gā'hĕr-ĭs*), knight of Round Table, **3068.**

**Gail'lard, Lieutenant-Colonel David** (1849–1913), Amer. soldier and engineer, b. Sumter County, S.C.; after 1908 in charge of construction of Panama Canal between Gatun and Pedro Miguel, **2656.**

**Gaillard Cut** (formerly known as the Culebra Cut), section of Panama Canal, **2663,** *pictures,* **2656.**

**Gaines' Mill.** Sanguinary battle in McClellan's campaign 1862, on Chickahominy R. 9 mi. n.e. of Richmond, Va.; it was 2d of the Seven Days' Battles.

**Gaines'ville,** Fla. Winter resort 65 mi. s.w. of Jacksonville; pop. 6900; U. of Florida.

**Gainsborough** (*gānz'bȯr-ō*), **Thomas** (1727–88), one of greatest Eng. portrait painters; "father of naturalistic landscape in England" ('The Blue Boy'; 'Georgiana, Duchess of Devonshire'—noble and winning yet truthful portraits); left more than 200 portraits; **2631;** portrait of Mrs. Siddons, *picture,* **2636.**

**Gai'seric,** king of Vandals. *See in Index* **Genseric.**

**Galahad** (*gāl'ȧ-hăd*), hero of Arthurian legends, **1391,** *pictures,* **224,** frontispiece, Vol. 6; embodies the ideal of purity, **2938.**

**Galapagos** (*gä-läp'ä-gōs*) or **Tortoise Islands,** 730 mi. w. of Ecuador; 2400 sq. mi.; pop. 400; **1079, 2619;** iguana, **1729.**

**Gala'ta,** chief business quarter of Constantinople, **871.**

**Galatea** (*găl-ȧ-tē'ȧ*). Statue made by the sculptor Pygmalion and endowed with life by Venus in answer to his prayer; also, nymph in various classical legends.

**Galatia** (*gȧ-lā'shĭ-ȧ*), anc. country in cent. Asia Minor; kingdom founded by Celts, **674.**

**Gala'tians, Epistle to the,** 9th book of the New Testament, written by the Apostle Paul to the Galatian churches about 56 A.D., **674.**

**Galatz** (*gā'läts*) or **Galati,** Rumania, important Danube port in e.; pop. 74,000; exports, **3082;** seat of Danube Commission, **962.**

**Gal'axy,** the Milky Way, **3341,** *picture,* **3343.**

**Galba** (*găl'bȧ*), **Servius Sulpicius** (5 B.C.–69 A.D.), Rom. emperor, **2436.**

**Galdhöppigen.** Peak in s. Norway, highest mt. in Scandinavia (8399 ft.).

**Galdos** (*gȧl-dōs'*), **Benito Pérez.** *See in Index* **Pérez.**

**Gale, Zona** (born 1874). Amer. story-writer, b. Portage, Wis.; depicts small town life with fidelity and humor ('Loves of Pelleas and Etarre', 'Friendship Village', "sweet" sentimental stories; 'Miss Lulu Bett', sharply drawn character study).

**Ga'len, Claudius** (130?–200? A.D.), Gk. physician, most celebrated anc. medical writer; during Middle Ages held, like Aristotle, as infallible; **121, 438.**

**Gale'na,** Ill., lead and zinc mining city in extreme n.w. of state; pop. 4742; **1733, 1974;** Grant's home, **1498.**

**Galena,** lead sulphide, **1974, 3390, 3761.**

**Gale'rius** (Galerius Valerius Maximianus), Rom. emperor 305–311

A.D.; rose from common soldier to be Diocletian's son-in-law and successor; and Constantine, **870.**

**Galesburg,** Ill. Mfg. city 40 mi. n.e. of Burlington, Iowa; pop. 23,834; packed meats, bricks, boilers, engines, farm machinery; Knox and Lombard colleges.

**Galicia** (*gă-lĭsh'i-ȧ*), Poland, agricultural dist. on n. slopes of Carpathians; 30,000 sq. mi.; pop. 8,258,000; former Austrian crownland, important in World War, **270–1;** Russian defeat, **3794.**

**Galicia,** dist. in n.w. corner of Spain, formerly kingdom; inhabitants, Gallegos, resemble Portuguese; chief city, Coruña; *map,* **3300.**

**Gal'ilee** (Hebrew "border" or "ring"), Rom. province in n. Palestine, land of Christ's boyhood and chief center of his active work, **2644–5, 1887.**

**Galilee** or **Gennes'aret, Sea of,** large pear-shaped lake in n. Palestine traversed by Jordan R.; 64 sq. mi.; frequented by Christ and disciples; also called Tiberias; **2645.**

**Galileo** (*gă-lĭ-lē'ō*) (1564–1642), great Ital. mathematician, physicist, and astronomer, **1391–2;** discovers laws of falling bodies, **1508,** *picture,* **1509;** invents microscope, **2228,** telescope, **3462,** *picture,* **241,** thermometer, **3486.**

**Gall** (*gąl*), **Francis Joseph** (1758–1828), Ger. anatomist, founder of phrenology, **2784.**

**Gall** or **Gallus, Saint** (d. 640? A.D.). Irish monk and missionary to European continent; founded monastery of St. Gall, Switzerland.

**Gal'las,** powerful and most numerous of Hamitic peoples of E. Africa and Abyssinia, **37.**

**Gal'latin, Albert** (1761–1849), Amer. economist and statesman, b. Switzerland, one of greatest financiers of U.S.; as sec. of treasury under Jefferson and Madison systematized government's finances, **1883.** Led negotiations for Treaty of Ghent (1815); minister to France 1816–23; minister to England 1826.

**Gallatin River,** Mont., flows n. 170 mi. from Yellowstone National Park, for 70 mi. through steep and picturesque canyon, to Missouri R.; **2273,** *map,* **2309.**

**Gallaudet** (*găl-ą-dĕt'*), **Thomas H.** (1787–1851), Amer. educator, b. Philadelphia, Pa., founder of first deaf-mute institution in Amer., **970.**

**Gallaudet College,** for deaf, at Washington, D.C., **970.**

**Gall-bladder, 2031, 1469.**

**Galle** (*gäl'ē*), **Johann Gottfried** (1812–1910), Ger. astronomer, discoverer of 3 comets and the planet Neptune, **247, 2818.**

**Galle** (*gäl*) or **Point de Galle.** Fortified seaport on s.w. coast of Ceylon; pop. 40,000.

**Galleon** (*găl'ē-ŏn*) (derived from galley), a three- or four-decked sailing vessel of 15th cent., **3208;** in Spanish Armada, **211.**

**Gal'leys,** ships propelled wholly or partly by oars; developed by Phoenicians, **3524, 3207;** Greek and Roman, **2426–7, 3524, 3207;** Middle Ages, **3208, 2427,** *picture,* **3525;** Spanish Armada, **211.**

**Gall-fly, 2548, 1779;** eggs, **1090.**

**Gal'lia.** *See in Index* **Gaul.**

**Galli-Curci** (*găl'lē-kûr'chē*), **Amelita** (Mrs. Homer Samuels) (born 1889). Ital.-Amer. coloratura soprano; famous rôles are Dinorah, Lucia, Juliette, Gilda in 'Rigoletto'.

**Gallieni** (*găl-yĕ-nē'*), **Joseph Simon** (1849–1916), Fr. general and colonial administrator, pacificator of Madagascar (1896–1905), military gov. of Paris (1914–15); conquers Madagascar, **2105;** at first battle of Marne, **2151,** *map,* **2150.**

**Gallinae** (*gă-lī'nē*), order of fowl-like birds, **412;** includes bob-white, **2943, 414;** grouse, **1543–5;** hen, **2908–11;** pheasant, **2759;** turkey, **3556.**

**Gal'lio, Lucius Junius Annaeus** (first cent. A.D.). Older brother of Seneca, Rom. pro-consul of Achaea (53 A.D.) who "cared for none of these things" when Jews haled the Apostle Paul before him; "careless Gallio" has become a synonym for easy-going indifference.

**Gallipoli** (*gă-lĭp'ō-lē*) (anc. Chersonesus), a peninsula separating the Dardanelles on c. from Gulf of Saros on w.; formerly Turkish, now Gk. territory; 55 mi. long, 4 to 13 mi. wide; seized by Ottoman Turks, **3557;** in World War, **3795, 963, 3810.**

**Gallipoli.** Port on Gallipoli peninsula, key to Dardanelles; pop. 25,000; former Turkish naval station.

**Gal'lium,** a rare metallic element resembling aluminum, found combined in certain zinc ores, **4042.**

**Gall-nut** or **nut-gall, 2548;** used in ink-making, **1779;** in tanning leather, **1976;** *picture,* **2548.**

**Gal'lon,** a unit of measure, **3715.**

**Gal'loway.** Former division of s.w. Scotland, comprising counties of Kirkcudbright and Wigtown, famous for breeds of horses and cattle; the Bruces were lords of Galloway.

**Gal'loway,** breed of beef cattle, **663.**

**Galls.** *See in Index* **Gall-nut.**

**Gals'worthy, John** (born 1867), Eng. novelist and dramatist; most of his novels and plays deal with social or economic problems; 'The Island Pharisees' is an attack on Brit. conventions; 'The Man of Property' satirizes modern capitalists; 'Fraternity' is largely a study in class feeling; 'The Dark Flower' has a morbid theme of passion; **1167, 2541, 1036;** chief plays, **1038.**

**Galt** (*gąlt*), **Sir Alexander T.** (1817–93). Canadian statesman; introduced decimal currency and protective tariff; promoted federation of Brit. N. Amer. provinces; son of John Galt.

**Galt, John** (1779–1839). Scotch novelist, whose sketches of Scotch life ('The Ayrshire Legatees'; 'The Annals of the Parish'; 'Last of the Lairds') have given him a secure place in history of the novel.

**Galt,** Ontario. Industrial center on Grand R. about 55 mi. s.w. of Toronto; pop. 13,500; machinery, engines, textiles, brass products, shoes, lumber products, safes.

**Gal'ton, Sir Francis** (1822–1911), Eng. anthropologist and meteorologist, noted student of heredity; made first attempt to chart weather on extensive scale and propounded anti-cyclone theory; on Athenian culture, quoted, **1522;** founded eugenics, **1187;** finger-prints, **1247;** theory of heredity, **1641;** related to Darwin, **963.**

**Galvani** (*gäl-vä'nē*), **Luigi** (1737–98), Ital. physiologist, discoverer of electric phenomena called "galvanism," **1120,** *picture,* **1121.**

**Galvanic cell, 1120.**

**Gal'vanized iron,** origin of name, **1120;** zinc used, **3839;** prevents rust, **3099.**

**Galvanom'eter,** device for measuring electric current, **1392, 1113,** *picture,* **1113;** in cabling, **557-8.**

**Gal'veston,** Tex., one of greatest cotton-exporting ports in world; pop. 44,255; **1392, 3477;** harbor, **3474;** level raised, **1041;** medical school, **3478.**

**Galway** (*gąl'wā*). Largest county of Connaught province, Ireland, in middle of w. coast; also seaport (pop. 16,000) at head of Galway Bay.

**Gama** (*gä'mä*), **Vasco da** (1460?–1524), Port. navigator and explorer, **1392–3;** results of his explorations, **2888, 1069, 1752.**

**Gamaliel** (*gă-mā'lĭ-ĕl*). A learned Pharisee, Paul's instructor in law (Acts xxii, 3); advocate in the Sanhedrin of moderate treatment of the Christian apostles (Acts v, 34–9).

**Gambet'ta, Leon** (1838–82), Fr. statesman and orator, anti-imperialist during Second Empire and Republican leader during and after Franco-Prussian War; premier in 1881; **1356, 1892.**

**Gam'bia,** Brit. colony and protectorate in W. Africa on both sides of lower Gambia R.; 4130 sq. mi.; pop. 240,000; cap. Bathurst; *map,* **40–1.**

**Gambia River.** Flows n.w. 1000 mi. through Fr. Senegal and Brit. Gambia into Atlantic at Bathurst; navigable for about 350 mi.

**Gam'bier,** Ohio. Village 50 mi. n.e. of Columbus; pop. 450; Kenyon College.

**Gambier,** a tanning substance, **1976.**

**Gamboge** (*găm-bōj'*), a gum-resin, **1552, 2997.**

**Games, 2832–8.** *See also in Index* **Sports and games.**

**Gamete** (*gă'mēt*), a reproductive cell, **1642,** *pictures,* **1643.**

**Gametophyte** (*gă'mē-tō-fīt*), a plant or plant structure which reproduces sexually, **1234.**

**Gamma rays** of radium, **2960.**

**Gamopet'alous plants,** a division of the angiosperms, **3533.**

**Gandhi** (*gŭn'dē*), **Mohandas Karamchand** (born 1869). Indian leader of the "non-coöperation" (passive resistance and boycott) movement for Indian self-government; sentenced by British 1922 to 6 years' imprisonment; strong influence over Moslems as well as Hindus; called "Mahatma" ("great-souled") by his followers.

**Ganesa** (*gą-nā'sȧ*) or **Ganesh** (Sanskrit "lord of the host"). Hindu god of wisdom and remover of obstacles, chief of the minor deities who attend Siva.

**Ganges** (*găn'jēz*) **River,** India, sacred r. of the Hindus, rises in Himalaya Mts., flows 1540 mi. into Bay of Bengal, **1393,** *map,* **1744;** at Benares, **381,** *pictures,* **381, 1743;** tidal wave, **3497;** valley, soil and population, **1745.**

**Gan'net,** a yoke-toed bird, related to pelican, **413;** robbed by frigate-bird, **1372.**

**Gan'oids,** a sub-class of fish with bony plates instead of scales, **1272, 1277, 3374.**

**Ganymede** (*găn'ĭ-mēd*), in Gk. myth., beautiful youth carried off to be cupbearer of Zeus, **1393.**

**Ganz, Rudolf** (born 1877). Swiss pianist and composer; came to U.S. 1900, playing and teaching with great success; in 1921 chosen director of St. Louis Symphony Orchestra; has written symphony, various smaller orchestral pieces, and about 200 songs.

**Gap,** in mountains, **3580, 158.**

**Gapon** (*gą-pōn'*), **Father George** (1870?–1906). Rus. priest, revolutionary and government spy; led strikers' march to Winter Palace on Red Sunday (Jan. 22, 1905); believed murdered by revolutionaries he had betrayed.

**Garcés** (*gär'thās*), **Francisco, 2446.**

**Garcia** (*gär-sē'ä*), **Manuel** (1805–1906). One of the most famous singing teachers of all time, for almost 50 years professor in Royal Academy of Music at London; Jenny Lind was one of his pupils; he invented the laryngoscope.

**Garcia Gutiérrez, Antonio.** *See in Index* **Gutiérrez.**

**Garcia y Iñiguez** (*ē'nyē-gäs*), **Calixto (1836–98).** Cuban patriot general, for many years a leader in revolutionary activities against Spaniards; commanded 4000 Cubans at El Caney in Span.-Amer. War.

**Gar'da, Lake,** largest lake of n. Italy, extending from Lombard plain into Tyrolean Alps; **1835,** *map,* **1836.**

**Garden, Mary** (born 1877). Amer. operatic soprano, remarkable for dramatic impersonation ('Melisande', 'Salome', 'Louise'); director of Chicago Opera Co. 1921–22 (first Amer. woman impresario); b. Aberdeen, Scotland.

**Garde'nia.** Genus of trees and shrubs of madder family (*Rubiaceae*), natives of tropical and sub-tropical regions; cape jasmine is a gardenia.

**Garden mint, 2257.**

**Garden of the Gods,** Colo., **842,** *picture,* **838.**

**Gardens and gardening, 1394–7;** fighting cutworms, **944;** hedges, **1627–8;** raspberries, **2977;** school gardens, **3142–3;** sprays and spraying, **3330–1;** strawberries, **3370;** fighting weeds, **3712–3;** what and when to plant in the vegetable garden, **1397;** 'A Wild Garden and Its Tenants', **2416–7.** *See also in Index* names of individual flowers, fruits, and vegetables.

**Garden State, 2457.**

**Gardinas** (*gär'dē-näs*), Lithuania. Same as **Grodno.**

**Gardiner, Samuel Rawson** (1829–1902). Eng. historian ('History of England', careful, nonpartisan, and based on exhaustive study).

**Gardiner, Stephen** (1483?–1555). Eng. prelate and statesman; succeeded Wolsey as bishop of Winchester; he was largely responsible for fall of Thomas Cromwell and fell heir to his power; lord chancellor 1553–55; a worldly-minded churchman, but man of erudition and friend of learning.

**Gardner,** Mass. Agricultural trade center, 23 mi. n.w. of Worcester; pop. 16,971; chairs, silverware, furniture, oil stoves, machinery.

**Gareth** (*gâr'ĕth*), **Sir,** knight of the Round Table, **3068;** how he became a knight, **3070.**

**Garfield, Harry Augustus** (born 1863), pres. of Williams College after 1908, b. Hiram, Ohio; son of Pres. James A. Garfield; **1398;** U.S. fuel administrator, **3802.**

**Garfield, James Abram** (1831–81), 20th president of U.S., **1398–9;** Blaine, sec. of state, **435;** memorial in Cleveland, **793.**

**Garfield, James R.** (born 1865), Amer. lawyer and govt. official, b. Hiram, Ohio; son of Pres. Garfield; U.S. commissioner of corporations 1903–07; sec. of interior 1907–09, **1398.**

**Garfield,** N.J. City on Passaic R. 10 mi. n.w. of New York City; pop. 19,381; textiles, embroidery, stone, wax paper, chemicals, rubber goods, cigars, machinery.

**Garga'no,** mountainous peninsula of s. Italy extending about 30 mi. into Adriatic, **1835.**

**Gargantua** (*gär-găn'tū-ȧ*), giant hero of Rabelais' satire of that name, whose "Gargantuan" appetite is proverbial, **2951.**

**Garibaldi** (*gä-rē-bäl'dē*), **Giuseppe** (1807–82), Ital. national hero, **1399;** part in Italy's unification, **1837–8, 3638;** and Victor Emmanuel, *picture,* **1837.**

**'Garibaldi Hymn',** Ital. national song, **1399, 2405.**

**Garland, Hamlin** (born 1860). Amer. novelist and short-story writer, prairie realist, b. West Salem, Wis. ('Main Traveled Roads'; 'Rose of Dutcher's Coolly'; 'A Son of the Middle Border'—pictures of mid-western life with strong local color).

**Gar'lic, 2581;** Burbank's "elephant" type, *picture,* **539;** introduced into Europe, **932.**

**Gar'misch,** Bavaria, small town 50 mi. s.w. of Munich, **1442.**

**Garner, Richard Lynch** (1848–1920), Amer. scientist, known for his research work in Africa on apes and monkeys, **738.**

**Gar'net,** semi-precious stone, **1409, 1410;** chemical composition, **104;** crystal, *picture,* **935.**

**Gar'nett, Richard** (1835–1906). Eng. librarian and author, keeper of the printed books in British Museum; wrote lives of Carlyle, Emerson, Milton; with Gosse wrote history of English literature.

**Garonne** (*gä-rŏn'*) **River,** chief r. in s.w. France, rises in Span. Pyrenees, flows n. into Bay of Biscay; length 357 mi.; **1345, 1192;** at Bordeaux, **466;** Canal du Midi, **1346;** *picture,* **3305.**

**Gar'rick, David** (1717–79), Brit. actor and manager, introduced more natural style of acting; inaugurated revival of Shakespeare's plays in their original form; universally considered greatest of Eng. actors, equally at home in tragedy or farce; associated with Dr. Johnson, **1898, 1166.**

**Gar'rison, William Lloyd** (1805–79), Amer. editor and leader of abolitionist movement, **1400–1;** friendship with Whittier, **3736;** and women's rights, **3778.**

**Garter, Order of the, 979;** Windsor Castle, **3751, 3752.**

**Garter snake, 3260–1.**

**Gar'vin, James Louis** (born 1868). Eng. journalist and publicist, ardent imperialist, most powerful champion of Chamberlain's tariff reforms; after 1908 editor of the *Observer,* which he made a great organ of opinion.

**Ga'ry, Elbert Henry** (born 1846), Amer. financier and promoter, b. Wheaton, Ill.; chairman of finance committee and board of directors of U.S. Steel Corporation; **1401.**

**Gary,** Ind., world's greatest steel-producing center; at head of L. Michigan, about 25 mi. from Chicago; pop. 55,378; **1401–2, 1760;** school system, **1401–2.**

**Gas, 1403;** air, **50–3;** in balloons, **312, 320;** carbon dioxide and monoxide, **642;** chlorine, **755;** created by combustion, **1250;** helium, **1629;** hydrochloric acid, **1710;** hydrogen, **1710;** "laughing gas," **124, 125;** liquefaction, **1618;** marsh gas, **642, 1406, 1408;** nature exemplified by air, **54, 55;** nitrogen, **2511–2;** oxygen, **2611–2;** poisonous kinds, **2855;** produced from solid matter by explosions, **1211.** *See also in Index* **Liquefied gases.**

**Gas, coal,** illuminating gas obtained by distilling coal, **1406–7;** coal-tar by-products, **814, 824;** obtained in coking, **1406, 824;** poisonous properties, **2855, 642.**

**Gas, illuminating,** any of several inflammable gases used for heating and lighting, **1406–7;** acetylene, **8;** danger of asphyxiation, **1716, 2855;** discovery and development, **1406, 1407, 1959;** discredited when first proposed, **1797;** for heating houses, **1624;** how to find leaks, **1716;** meters, **2205;** natural gas, **1407–8;** Pintsch gas, **1407;** regulation of companies, **2932;** water gas, **1407.**

**Gas, natural, 1407–8;** a bitumen, **2750;** in Canada, **610;** conservation needed, **869;** geologic age of, **1418;** yields helium, **1629.** —*U.S. resources:* Ala., **70;** Ind., **1760;** Kan., **1911;** Ky., **1919;** La., **2070;** Ohio, **2567, 2570;** Okla., **2576;** Pa., **2720;** W.Va., **3723.**

**Gas, water,** a fuel and illuminating gas, **1407.**

**Gas black,** a type of lamp black; used in printing ink, **1780.**

**Gasconade River,** Mo., rises in s. and flows n. 200 mi. to Missouri R.; *map,* **2270.**

**Gas'cony,** former duchy in s.w. France; boundaries were Bay of Biscay, Garonne R., and the Pyrenees; *map,* **1351;** acquired by Eng. crown, **1633;** people, **1344;** redemption of Landes, **3122.**

**Gascony, Gulf of, 1344.**

**Gas engine,** one which uses exploding gas or vapor as a propelling force, **1403–6;** in airplanes, **56, 58, 60;** in automobile, **280–2;** Diesel type, **1406;** Gnôme, **58,** *picture,* **65;** in dirigibles, **314, 316,** *pictures,* **318–9;** Liberty motor, **60;** motorboat types, **2357;** Otto type, **1404,** *picture,* **1405;** turns heat into mechanical work, **1621.**

**Gas'kell, Elizabeth Stevenson** (1810–65), Eng. novelist; many of her books deal with poor workmen in Manchester; 'Cranford', her best work, is a delightfully humorous sketch of village life; she wrote an admirable 'Life of Charlotte Brontë'; **2540.**

**Gas mask, 1408;** contains charcoal, **688;** use in World War, **3791,** *picture,* **3797.**

**Gas meter, 2205.**

**Gasoline,** a liquid distilled from petroleum, **1408, 2753–4, 1014;** as illuminant, **1407.**

**Gaspar'ri, Peter S.** (born 1852). Ital. Rom. Catholic cardinal, sec. of state under Pope Benedict XV.

**Gaspé** (*gäs-pā'*), a dist. and peninsula in s.e. Quebec, projecting into Gulf of St. Lawrence; an elevated plateau traversed by Notre Dame Mts.; lumbering and fishing; village of Gaspé scene of Cartier's landing, in 1534; *map,* **602–3.**

**'Gas'pee',** Brit. vessel, **3010.**

**Gaspé Park,** Canada, **2400.**

**Gasperaux** (*gäs'pē-rō*), village in Nova Scotia, *picture,* **2538.**

**Gasto'nia,** N.C. Mfg. town 20 mi. w. of Charlotte; pop. 12,871; yarns, cotton goods, auto tires, hosiery, textile machinery.

**Gastric juice, 3360, 1010, 1011;** contains hydrochloric acid, **755;** contains pepsin, **2724;** secretion, **1469.**

**Gas'tropods,** a class of mollusks, **2280–1, 3945;** snails and slugs, **3255–6.**

**Gas warfare, 1408, 2855;** drill in use of masks, *picture,* **3797;** prohibited by Hague Peace Conference, **1559;** in World War, **3791.**

**Gate of the Giants,** Shetland Isls., **3206.**

**Gates, Eleanor** (Mrs. Frederick Moore) (born 1875), Amer. novelist and playwright, b. Shakopee, Minn.; wrote 'The Biography of a Prairie Girl'; 'Cupid, the Cow-Punch'; 'The Poor Little Rich Girl'; **1238.**

**Gates, Horatio** (1728–1806), Amer. general, **1408–9, 3126, 3003;** Conway Cabal, **3003;** at Camden, **3004, 987.**

**Gates'head.** Mfg. town in n.e. England; pop. 129,000; practically suburb of Newcastle, opposite it on Tyne R.; here Defoe wrote 'Robinson Crusoe'.

**Gates of the Rocky Mountains,** gorge in Mont., **2273.**
**Gath,** Philistine city, **2770, 967.**
**Gatineau** (*găt'i-nō*) **River,** in Canada, flowing s. 400 mi. into Ottawa R., **2604.**
**Gat'ling, Richard Jordan** (1818–1903), Amer. inventor, b. Hertford County, N.C.; invented the revolving battery gun, **2097.**
**Gatling gun, 2097.**
**Gatti-Casazza** (*gät'tē-ka-zät'sa*), **Giulio** (born 1869). Ital. operatic manager, director of La Scala, Milan, and later of Metropolitan Opera House, New York City.
**Gatun** (*gä-tụn'*), town in Panama Canal Zone; dam and artificial lake in Panama Canal, **2658, 2662–3,** *pictures,* **2654, 2657–9.**
**Gauchos** (*gou'chōz*), cowboys of Argentina, **192.**
**Gau'den, John** (1605–62). Eng. churchman and writer; reputed author of the celebrated 'Eikon Basilike', a defense of Charles I purporting to have been written by the king himself; bishop of Exeter and of Worcester.
**Gauge,** of railroad track, **2965.**
**Gauge,** of wire, **3758.**
**Gauge, rain, 2974.**
**Gauguin** (*gō-găn'*), **Paul** (1848–1903), Fr. painter, pioneer post-impressionist; disgusted with civilization, went to Tahiti and lived native fashion, painting strange, violent, conventionally unbeautiful pictures; **2634.**
**Gaul** (*gạl*) or **Gallia,** Latin name for districts of Celtic peoples; (a) Cisalpine Gaul, now n. Italy; (b) Transalpine Gaul or Gaul, now modern France and Belgium with parts of Holland, Germany, and Switzerland; conquered by Romans, **1352, 674, 564, 1445, 1446;** Barbarian invasions, **1343, 1195, 3617.**
**Gauls,** Celtic people who early invaded w. Europe; capture Rome, **3044, 674;** in France, **1343, 2685.**
**Gaultier, Lucien, 3111.**
**Gaunt, John of.** *See in Index* **John of Gaunt.**
**Gaur** (*gour*), bison of India, **1748.**
**Gauss** (*gous*), **Karl Friedrich** (1777–1855). Ger. mathematician and physicist, one of the most brilliant of modern times; founded mathematical theory of electricity.
**Gautama** (*gạ'tà-mà*) or **Gotama,** family name of Buddha, **524.**
**Gautier** (*gō-tyā'*), **Théophile** (1811–72). Fr. poet, novelist, and critic, originator of the theory of "art for art's sake" in France; a genius within narrow limits; 'Emaux et Camees', his masterpiece, a collection of poems exhibiting his love of miniature effects; 'Mlle. de Maupin', an attempt at self-analysis; 'History of Romanticism'.
**Gavarni** (*gà-vär-nē'*) (1804–66). Fr. caricaturist and illustrator; real name Guillaume Chevallier; prolific critic of Parisian life, especially of the poorer and somewhat disreputable classes.
**Gav'eston, Piers** (d. 1312), earl of Cornwall, arrogant, extravagant favorite of Edward II of England; beheaded by Eng. barons, **1088.**
**Ga'vial,** Indian reptile of crocodile type, **923.**
**Gavotte** (*gà-vŏt'*). Originally a Fr. peasant dance, merry and light; after its introduction at court in 16th cent. became quieter and more dignified; very popular as a theatrical dance; special music for it written by Bach, Glück, Grétry, and others.
**Gawaine** (*gạ'wān*), in Arthurian legend, nephew of King Arthur and knight of the Round Table; called "the Courteous"; **3068.**
**Gay, John** (1685–1732), Eng. poet and dramatist ('Beggars' Opera', famous social satire, created furore in its day; 'Fables', masterpieces in their kind); epitaph, **3719.**
**Gay'ley, James** (1855–1920). Amer. metallurgist and manufacturer, b. Lock Haven, Pa.; invented Gayley refrigerated dry-air blast in blast-furnaces; 1901–09 first vice-pres. U.S. Steel Corporation.
**Gay-Lussac** (*gā-lü-säk'*), **J. L.** (1778–1850). Fr. chemist and physicist, discoverer of important law that volumes of combining gases bear simple and constant ratio to each other; pioneer in scientific balloon observations.
**Gaza** (*gā'zà*), Palestine, anc. town 50 mi. s.w. of Jerusalem; most important of the 5 Philistine cities; **2770.** It was taken by Alexander the Great, and later became a rival of Alexandria and Athens as a center of Hellenic culture; modern port and commercial center; pop. 35,000.
**Gazelle** (*gà-zĕl'*), an antelope of n. Africa, **146,** *picture,* **147.**
**Gdansk,** Polish name for Danzig, **962.**
**Gears,** automobile, **278, 283–5.**
**Geasa,** an Irish spell, **2118.**
**Geatland,** perhaps same as Götaland, in 'Beowulf', **384.**
**Gebel** (*ġĕb'ĕl*), dist. of Tripoli, **3542.**
**Geck'o,** lizard, **2037,** *picture,* **2038;** foot, *picture,* **1323.**
**Ged, William** (1690–1749). Scotch goldsmith and printer, inventor of stereotyping.
**Geddes** (*gĕd'ĕs*), **Sir Auckland Campbell** (born 1879). Brit. ambassador to U.S. since 1920; formerly professor of anatomy at McGill Univ.; in 1916 made Director of Recruiting and thereafter held various offices in Lloyd George cabinet.
**Geddes, Sir Eric** (born 1875). Brit. director-general of military railways and inspector-general of transportation in all theaters of war (1916–17); first lord of the admiralty and controller of the navy (1917–18); brother of Sir Auckland.
**Geddes, Jenny, 3148.**
**Geelong** (*gē-lông'*), Australia. Seaport in Victoria 40 mi. s.w. of Melbourne; pop. 34,000; woolen trade and mfrs.; quarrying.
**Gehen'na,** or Valley of Hinnom, in Palestine near Jerusalem, **1885.**
**Geikie** (*gē'kĭ*), **Sir Archibald** (born 1835), Scotch geologist ('Story of a Boulder'; 'Class Book of Geology', etc.); calculates earth's age, **1060.**
**Geissler** (*gīs'lēr*), **Henry** (1814–79). German maker of scientific instruments, for whom Geissler tubes were named.
**Geissler tube, 3824.**
**Gel'atin** or **gelatine,** a proteid-like jelly of unknown chemical composition, obtained by boiling various animal tissues, **1409;** in candy, **630;** glue an impure form, **1475–6;** isinglass, **1832;** on photographic negatives, **2780–1.**
**Gelée** (*zhĕ-lā'*), **Claude,** Fr. painter. *See in Index* **Claude Lorrain.**
**Gelsemium** (*ġĕl-sē'mi-ŭm*). A drug obtained from the rootstocks of *Gelsemium sempervirens,* a climbing shrub native to the s. U.S. containing a milky juice and having shining leaves and axillary clusters of large fragrant yellow flowers; used as remedy for rheumatism and neuralgia; in large doses sometimes causes death.
**Gelsenkirchen** (*ġĕl'zĕn-kĭrĸ-ĕn*). Industrial town in Westphalia, Germany, 8 mi. n.w. of Essen; pop. 169,000; coal mines, iron and steel works, soap, glass, chemicals.
**Gemara** (*ġĕ-mä'rà*), part of the Talmud, **1625.**
**Gemini** (*ġĕm'i-nī*) or **Twins,** a constellation in the zodiac, **3840, 657;** where located, *charts,* **873, 3343.**
**Gem'mae,** or "brood buds," **2032.**
**Gemma'tion,** reproduction of a cell by growth of a bud which develops into a new cell, *picture,* **671;** in yeast, **3828.**
**Gems,** or precious stones, **1409–11;** artificial, **1410;** Brit. crown jewels, **2050;** Burma, **541;** cameo, **591;** Ceylon, **685;** corundum varieties, **1142;** cutting, **1410;** diamonds, **1001–5;** Mont., **2310;** Nev., **2445;** N.M., **2466;** pearls, **2702–3;** quartz varieties, **2945;** Ural Mts., **3606–7.**
**Gendarmes** (*zhäṅ-därm'*), Fr. national police, employed in all depts. and colonies, **2865.**
**Gender,** in grammar, of nouns, **2537;** pronouns, **2922.**
**Genera** (*ġĕn'ĕ-rà*). *See in Index* **Genus.**
**General,** in U.S. Army, grade appropriate to command of a field army, **218;** term often loosely applied to any commander higher than colonel, such as brigadier general; U.S. insignia, **3576.**
**General Education Board,** chartered by Congress in 1903; has resources of $100,000,000; **3034.**
**General Federation of Women's Clubs, 3777.**
**General Grant National Park,** 4 sq. mi.; formed in 1890 to shield the famous sequoia tree "General Grant," 35 ft. in diameter and 264 ft. high, believed to be the oldest living tree in world; **2400.**
**General Land Office, U.S.,** bureau of Dept. of Interior; commissioner appointed by Pres.; established 1812; administers public lands, **1960.**
**General Staff.** An organized body of officers which assists the commander-in-chief or chief executive in controlling the land or naval forces of a nation; sometimes created for a major detachment, such as the A.E.F.
**General Staff Corps,** U.S. Army, the Amer. general staff, created in 1903, **217–8;** insignia, **3576.**
**Generations, alternation of.** *See in Index* **Alternation of generations.**
**Generator,** in electricity. Same as **Dynamo.**
**Genesee' River,** N.Y., rises in Pa.; empties into L. Ontario 7 mi. n. of Rochester; 135 mi. long; **3033.**
**Genesis** (Gk. "coming into being"). The first book of the Bible, sometimes called Book of Creation; it tells of the creation of the world, of the foundation of the Israelite nation, and of the nation's history down to deaths of Jacob and Joseph in Egypt.
**Genêt** (*zhē-nā'*), **Edmond C. E.** (1765–1834), "Citizen Genet," Fr. diplomat, minister to U.S. (1793–94) sent to induce U.S. to declare war on Gt. Brit.; U.S. requested his recall for unneutral acts; married daughter of Gov. George Clinton and became Amer. citizen; commissions George Rogers Clark, **783.**
**Genet'ics,** the scientific study of heredity, **398, 399, 473.**
**Geneva,** N.Y. City on Seneca L. 38 mi. s.e. of Rochester; pop. 14,648; razors, optical supplies, stoves, boilers; extensive nurseries; Hobart College.
**Geneva,** Switzerland, city on L. Geneva; pop. 140,000; **1411–2, 3416;** bows for hat bands, **1598;** center of Calvinism, **587, 3415;** League of Nations, **1974;** Red Cross, **2983–4; 2986.**
**Geneva** (Fr. Lac Leman), largest lake in Switzerland, in s.w. bordering on France; 224 sq. mi.; 45

mi. long; **1412,** *picture,* **1411;** fed by Rhone, **3012, 3414;** geological formation, **1957.**

**Geneviève** (*zhĕn-vyêv'*) (422?-512 A.D.). Patron saint of Paris, said to have saved Paris from Attila's Huns by her prayers; caused church to be built over tomb of St. Denis.

**Genghis (Jenghis,** or **Jinghis) Khan** (*ġĕn'ġis kän*) (1162–1227), Mongol conqueror who first raised Mongol race to power, and swept over Asia, **2285, 746, 1752.**

**Genie** or **jinn,** a supernatural being of vast magical powers, **2118;** in the 'Arabian Nights', **169–70.**

**Genlis** (*zhän-lēs'*), **Stephanie, Comtesse de** (1746–1830). Fr. author and educator, tutor to Philippe Egalité's children, including Louis Philippe; anticipated many modern methods of teaching.

**Gennargentu** (*ġĕn-är-ġĕn'tọ*), **Mt.,** Sardinia, **3127.**

**Gennes'aret, Lake** or **Sea of.** *See in Index* **Galilee, Sea of.**

**Genoa** (*ġĕn'ō-ȧ*), Italy, seaport on Mediterranean, gateway to n. Italy; pop. 300,000; birthplace of Columbus; 1922 conference of European powers to consider economic restoration of Europe; **1412, 1844,** *pictures,* **1845, 1846;** defeats Pisans, **2811;** sells Corsica, **1195, 894;** war with Venice, **3625.**

**Genoa, Gulf of,** large indentation of Mediterranean in n.w. Italy, with city of Genoa at its head; broad southern portion known as Ligurian Sea; *map,* **1836.**

**Genre** (*zhän'r*) **painting, 2631.**

**Genseric** (*ġĕn'sēr-ĭk*) or **Gaiseric** (390?–477 A.D.), Vandal king; conquered n. Africa including Carthage (429–39); plundered Rome (455), **3617–8.**

**Gentian** (*ġĕn'shȧn*), an autumn flower, **1412-3.**

**Gentiles.** Term often used in Bible, especially in New Testament, to designate non-Jews.

**Gentryville,** former name for Lincoln City, Ind., **2011.**

**Genus** (*ġē'nŭs*), a group of related species, **412.**

**Geod'esy,** measurement of the earth or portions of the earth's surface, **3397, 242.**

**Geodet'ic surveying,** surveying in which the curvature of the earth is taken into account, **3397, 3398.**

**Geoffrey** (*ġĕf'rĭ*) **of Monmouth** (1110?–1154), Welsh historian, bishop of St. Asaph; Arthurian legends, **223, 1163.**

**Geoffrey Plantag'enet** (1113–51), count of Anjou, husband of Matilda, daughter of Henry I of England, and father of Henry II, **3352, 1633.**

**Geoffroy-Saint-Hilaire** (*zhō-frwä'-sănt-ē-lâr'*), **Etienne** (1772–1844). Fr. naturalist, pre-Darwinian believer in mutability of species, founder of the science of teratology or study of monsters.

**Geography,** science that describes the earth's surface, its natural products, its peoples and their economic activities, **1413–6,** *Study Outline,* **3861–3934;** ancient knowledge, **1416, 36, 1064, 2932;** climate and weather, **794–5, 2972–4, 3366–7, 3750–1, 3707–9;** distribution of human race, **2956–7, 2880–1;** distribution of plants and animals, **1076, 404, 3533;** international date line, **3501;** latitude and longitude, **1968–9, 2061;** maps and map making, **2142–3, 3397–8;** oceans, **2553–9;** physical features affect human history and industry, **2790, 2358, 1192–3, 1188;** physical geography, **2787–92;** shape and size of the earth, **1064;** standard time, **3500–2;** prevailing winds, **3750–1.** *See also in Index* **Explorers and explorations;** the principal topics above, and the continents and countries by name.

**Geological Survey, U.S.,** a bureau of the Dept. of the Interior established in 1871, **3600–1.**

**Geol'ogy,** the science of the earth, its origin, evolution, materials, and physical structure, **1417–22, 3144,** *Study Outline,* **3862, 3870;** age of earth, **1060, 1420;** cave formation, **664–6;** chalk formation, **685, 571;** chemical composition of earth, *picture,* **1058;** climate changes, **1420, 1422, 795, 1721;** coal formation, **1418, 811, 812;** earthquakes, **1004–5;** flint formation, *picture,* **1335;** fossils, **1334, 1336, 1417, 1418, 1420, 398;** Ice Age, **1720–1, 1466;** idea of earth's evolution established by Lyell, **964;** igneous rocks, **1417, 1230, 1497;** lava, **1971–2;** limestone, **2010, 571;** metamorphic rocks, **1417, 3248;** mountain formation, **2357–8, 2788, 2790;** natural gas, **1408;** origin and evolution of earth, **1417, 1209, 2818–9, 1058–60;** paleontology, **1336;** periods of geologic time, **1418–20;** petroleum deposits, **2750, 2751;** related to physiography, **2787:** rivers, **3022–3, 2791;** sedimentary rocks, **1417, 2010, 3123;** shale, slate, and loam formation, **784, 3248,** *picture,* **1421;** silicon materials, **3233–4;** soils, **3272–3;** stratified rock, **2944;** supplies data to biology, **398;** valleys, **3615, 2791;** volcanoes, **3657–60;** winds as geologic forces, **3750, 2787;** work of water, **3693.** *See also in Index* **Earth; Physiography;** and the principal topics above by name.

**Geom'etry,** the science that treats of mathematical relations and measurements in space, **1422–8, 3144;** analytical, **1428;** Pythagorean contributions, **2942;** non-Euclidean, **1428;** projective, **1428;** in surveying, **3397–8.**

**Geophyte** (*ġē'ō-fīt*), a plant with an underground root or tuber, **532.**

**George I** (1660–1727), king of England, **1428, 2150;** and Handel, *picture,* **1573.**

**George II** (1683–1760), king of England, **1428, 2046;** and Chatham, **700;** Seven Years' War, **3180.**

**George III** (1738–1820), king of England, **1428, 1430;** and Chatham, **700;** colonial policy, **975, 2869;** and William Pitt, **2812;** Seven Years' War, **3180.**

**George IV** (1762–1830), king of England, **1430.**

**George V** (born 1865), king of England, **1430;** sisters, **1089,** *pictures,* **1429, 1756.**

**George I** (1845–1913), king of Greece, **1526, 757.**

**George II** (born 1890). King of Greece; proclaimed Sept. 1922 following abdication of his father, King Constantine.

**George, Saint** (d. 303), patron saint of England, **1430;** how he slew the dragon, **1027.**

**George, Anne E.,** founds first Amer. Montessori school, **2314.**

**George, David Lloyd.** *See in Index* **Lloyd George.**

**George, Henry** (1839–97), Amer. author and political economist, b. Philadelphia, Pa.; named "single tax" and made it a social creed ('Progress and Poverty'); **3442;** opposed by Roosevelt, **3059.**

**George, W. L.** (born 1882), Eng. novelist and essayist; 'Caliban' and 'Blind Alley' are considered his best novels; also wrote 'The Intelligence of Woman', 'Woman and Tomorrow'; **2541.**

**George, William R.** (born 1866), Amer. sociologist, b. West Dryden, N.Y.; founder of the "George Junior Republic," a self-governing juvenile commonwealth; **1430.**

**George, Lake,** long narrow lake in e. N.Y. enclosed by mts.; 32 mi. long; famed for beauty; battles in Fr. and Indian War; **2482,** *picture,* **2481.**

**George Junior Republic, 1430.**

**George Petrovitch.** *See in Index* **Kara-George.**

**George Peabody College for Teachers.** A co-ed. non-sectarian institution at Nashville, Tenn., organized 1910 to succeed Peabody Normal College; founded by the George Peabody Fund.

**Georgetown,** cap. of Brit. Guiana, on n. coast of S. Amer. at mouth of Demerara R.; pop. 55,000; tropical exports; **1547.**

**Georgetown,** Ky. Agricultural and stock raising center 18 mi. e. of Frankfort; incorporated 1790; pop. 3903; Georgetown College.

**Georgetown** or **Penang.** Cap. of Penang Island, Straits Settlements, 2½ mi. from w. coast of Malay Peninsula; 2d largest port in the Straits.

**Georgetown,** former town, now part of Washington, D.C., **3684.**

**Georgetown College.** At Georgetown, Ky.; co-ed., Bapt.; founded 1829; arts and sciences.

**Georgetown University,** Rom. Cath. (Jesuit) institution for men, in Washington, D.C.; founded 1789; arts, philosophy, medicine, dentistry, law; **3684.**

**George Washington University.** At Washington, D.C.; co-ed.; founded 1821 by the Baptists as Columbian College; since 1904 under present name and non-sectarian; arts and sciences, engineering and mechanical arts, teachers' college, law, medicine, dentistry, pharmacy, veterinary medicine.

**Georgia,** republic of Asia, bordering on the Black Sea, 35,000 sq. mi.; pop. 2,700,000; cap. Tiflis; **1434, 3560,** *maps,* **434, 1196–7.**

**Georgia,** a S. Atlantic state of the U.S.; 59,265 sq. mi.; pop. 2,895,832; cap. Atlanta; **1431–4,** *maps,* **1432, 3584–5;** chief cities, **254, 3130;** cotton, **1431, 904;** origin of name, **3347;** pine, **1431, 1432;** rice-growing, **1431, 3014;** state flower, **3347;** surface, **1431;** watermelons, **2196.** —*History,* **1432, 1434;** part of Carolina, **3292;** Savannah founded, **3130;** conquered by British in Rev. War, **3004;** Indian lands, **1857;** in Civil War, **857, 3130, 3353, 3206.**

**Georgia, University of,** state institution for men at Athens, Ga.; opened 1801 (chartered 1785); classics, agriculture, law, pharmacy, forestry, state normal school; **1432,** *picture,* **1433.**

**Georgian Bay,** an arm of L. Huron, **1705, 1513, 627.**

**Georgia pine,** or yellow pine, **2808, 1431, 1432.**

**'Georgics',** poem by Vergil, **3630.**

**Geot'ropism,** tendency of plant structures, especially roots, to seek the earth, **2827;** seen in bean rootlet, *pictures,* **348.**

**Geraldine** (*ġĕr'ăl-dĭn*), **the Fair.** Lady Elizabeth Fitzgerald, celebrated in some of the Earl of Surrey's sonnets; in late romantic legend, object of Surrey's fantastic chivalrous devotion.

**Gera'nium,** flowering plant, **1435.**

**Gerard', James W.** (born 1867), Amer. lawyer and diplomat, b. Geneseo, N.Y.; ambassador to Germany 1913–17 ('My Four Years in Germany'); **3799.**

**Gerbert** (later Pope Sylvester II) (d. 1003), tutors Otto III, **2606.**

**Gerfalcon** (*ġĕr'fą-kn*), **1606.**

**Géricault** (*zhā-rē-kō'*), **Theodore** (1791–1824). Fr. painter, leader of realistic school and revolt against David's classicism.

**Gerizim** (*gĕr'ĭ-zĭm*), **Mt.,** Palestine, **2643.**
**Germ,** popular name for a disease-producing bacterium and protozoan, **1449–52.** *See also in Index* **Germ Theory of Disease.**
**Germ.** The embryo, usually small, in a seed or egg. *See in Index* **Embryo.**
**German Confederation, 1448, 1196.**
**German East Africa,** now Tanganyika Territory, **1068, 1069,** *map,* **1069;** British conquer, **3796;** part added to Congo State, **860.**
**Germanic** or **Teutonic languages, 1435, 2771;** contribution to English, **1161–2;** Scandinavian group, **4042.**
**German'icus, Caesar** (15 B.C.–19 A.D.). Rom. general, nephew of Tiberius; had nearly conquered Germany when jealousy of Tiberius led to his recall and transfer to Syria; believed to have been poisoned at instigation of emperor.
**Germa'nium,** a metallic element, **4042.**
**German language, 1435–6;** number of people speaking, **2772;** in Switzerland, **3415.**
**German literature, 1435–8;** chief authors and their works, **1438;** drama, **1034, 1038;** Goethe's influence, **1478, 1438;** novel, **2541.** *See also in Index* names of chief writers.
**German mile, 3715.**
**German** or **Teutonic tribes, 1194, 2956, 3134;** converted to Christianity, **454, 1436;** conquer England, **1152;** described by Tacitus, **1446, 1435;** invade Roman Empire, **1446, 1343;** languages and literature, **1435–6;** law, **909;** Northmen, **2525–8;** slavery, **3248;** *See also* separate tribes by name.
**German roach, 818.**
**German silver, 2506–7, 99.**
**German Southwest Africa,** now Southwest Africa Protectorate, **3283, 475, 3254.**
**Germantown,** Pa., former n.w. suburb, now dist., of Philadelphia, **2762;** scene of Rev. War battle, **3003, 3707.**
**Germany,** a republic of federated states in cent. Europe; proclaimed Nov. 9, 1918; 180,000 sq. mi.; pop. 60,000,000; cap. Berlin; **1439–49,** *maps,* **1440, 1196–7,** *Study Outline,* **3905;** architecture (Gothic), **181–7, 834;** army decorations, **979,** *pictures,* **977;** chief universities, **832, 386, 454, 1628, 1985;** education, **3138, 3140, 1444, 832;** folk customs and festivals, **347, 759, 1443, 1595, 2369;** Ice Age in, **1720;** illiteracy, **2881;** opera, **2584;** painting (early), **2630;** patriotic songs, **2405;** religion, **2994, 1441, 347, 3132;** Wagnerian music festivals, **3663.**
*Geography and industries:* agriculture, **1440, 1441;** Baltic coast, **321, 1440;** brewing, **347, 2369–70;** cap. Berlin, **385–6;** chief cities and manufactures, **1439, 1440, 1442–4, 347, 3131–2** (*see also* under names of cities); chief states, **346–7, 2928–9 3131–2;** dye industry, **1049–50;** fisheries, **1283;** foreign trade, **1444, 502, 1049, 2898;** forests, **1440, 1442, 433–4, 1595;** minerals, **1443, 1444, 1194, 1595, 1820;** mountains, **1439–40, 1442, 1595, 101–2, 433–4;** population, **770,** *map,* **1190–1;** potash, **1443, 2898, 2900, 1235;** potatoes, **1440, 2900;** rainfall, *map,* **1190–1;** rivers and canals, **1439, 1440, 1107, 961, 3005–6, 626, 1568;** shipping, **3219;** silk industry, **3235, 3236;** sugar beets, **3385;** surface, *map,* **1190–1;** toy manufactures, **3522, 1026;** vegetation, *map,* **1190–1.**
*Government,* **1444–5;** before World War, **1449;** Prussian dominance, **2929;** free cities, **1567–8, 502;** national debt, **2399;** socialism, **3310, 3269.**
**Germany, history of,** general sketch, **1445–9;** chief events summarized, **1658–60.**
*Beginnings and Middle Ages* (to 1517), **1445–8;** Huns invade, **1704;** Christianity introduced, **454;** under Charlemagne, **688–90, 3132;** partition of Verdun, **1195, 3629;** Holy Roman Empire revived, **1674, 2606;** Saxon and Franconian kings, **3132, 2606, 1632;** Henry IV and investiture conflict, **1541, 1632–3;** Hohenstaufen rulers, **1672;** Frederick I, **1358, 930;** Frederick II, **1358, 1360, 2391;** Golden Bull, **1675, 691;** Hapsburg rulers, **1576, 1578;** Hanseatic League, **1576;** work of Teutonic Order, **932, 1195;** first postal system, **2896.**
*Reformation and religious wars* (1517–1640), **2987–9, 1448;** Luther, **2084–5;** Charles V, **690–1, 1354;** Peasants' Revolt, **1448, 2987;** Thirty Years' War, **3488–9, 1553–4, 1448, 1195.**
*Rise of Prussia* (1640–1871), **2928–9, 1448–9, 1672;** Frederick the Great, **1360–1, 2147, 2856;** Seven Years' War, **3180–1;** wars of Fr. Revolution and Napoleon, **1368, 1370, 2394, 2395;** serfs freed, **3249;** Revolution of 1848, **3737, 3772, 1357;** Bismarck's work, **427–8;** Schleswig-Holstein seized, **994, 997;** Seven Weeks' War, **428;** N. German Confederation formed, **1448;** Franco-Prussian War, **1355–6, 427, 428, 2207;** Empire proclaimed, **428, 3633.**
*Under the Empire* (1871–1918), **1448–9;** Triple Alliance, **1196;** clash over Samoan Isls., **1592;** Venezuelan debts dispute, **3623;** Moroccan incidents, **2327–8;** colonies before World War, **1449, 40, 2624, 3195;** Far-Eastern policy, **2201;** Balkan and Near-Eastern policy, **310, 304, 233;** militarism and rivalry with Gt. Brit., **3738, 3790, 1196;** World War and peace settlement, **3789–3812, 1444, 3747–8, 3905, 1662.**
*Founding of the Republic,* **1444–5;** revolution of 1918, **3808;** William II abdicates, **3738;** Constitutional convention (1919), **3715;** peace signed with U.S., **3812;** reparations payments, **1582.** *See also in Index* names of chief events, states, and historical characters. For lists of rulers *see in Index* **Holy Roman Empire; Prussia.**
**Germination,** start of growth toward mature individual of a seed or egg germ, **394;** seen in bean, *pictures,* **348.**
**Germ Theory of Disease, 1449–52, 399, 2192;** animal germs or protozoans, **2927;** antiseptics, **150–1, 755;** antitoxins, **151–2;** bacteria or vegetable germs, **302–3;** disease carried by insects, **1292, 1312, 2334–8;** Lister's work, **150;** parasitic character of germs, **2677, 396;** Pasteur, **2692;** sleeping sickness, **3546;** vaccines and vaccination, **3613.**
**Gérome** (*zhā-rōm'*), **Léon** (1824–1904). Fr. painter and sculptor, noted especially for his spirited portrayal of oriental and classical scenes ('Gladiators Before Caesar'; 'Slave Market in Rome').
**Geronimo** (*ǧĕ-rŏn'ĭ-mō*) (d. 1909), Apache (Chiricahua) chief; harried and terrorized Ariz. and N.M. 1884–86; surrendered to Gen. Crook, escaped, was recaptured by Gen. Miles; **1773, 2467.**
**Gerould, Katherine Fullerton** (born 1879). Amer. essayist and story-writer, b. Brockton, Mass. ('Vain Oblations').
**Gerry, Elbridge** (1744–1814), Amer. statesman, b. Marblehead, Mass.; one of the signers of the Declaration of Independence; gov. of Mass. 1810–12; opposes constitution, **3593;** X Y Z Affair, **3826;** elected vice-president, **2108;** Gerrymander named for, **1452.**
**Gerry, Elbridge T.** (born 1837). Amer. philanthropist, b. New York City; leading organizer of the Society for Prevention of Cruelty to Children, often popularly called the "Gerry Society."
**Ger'rymander, 1452–3.**
**Geryon** (*ǧē'rĭ-ŏn*), a monster in Gk. myth., **1640.**
**Gessler** (*ǧĕs'lĕr*), a legendary Austrian official; and William Tell, **3463–5.**
**Gethsemane** (*ǧĕth-sĕm'ā-nē*), garden e. of Jerusalem; scene of Christ's agony on night before crucifixion; **1886, 1888.**
**Gettysburg** (*ǧĕt'ĭz-bûrǧ*), Pa., small town 35 mi. s.w. of Harrisburg; scene of decisive battle of Civil War; national cemetery, **2014.**
**Gettysburg, battle of** (July 1–3, 1863), **1453–4, 1984;** Hancock at, **1571;** Meade at, **2179.**
**Gettysburg Address, 2014.**
**Geyser** (*ǧī'zĕr*), **1454–6,** *picture,* **2789;** in Iceland, **1723;** in New Zealand, **2499;** Yellowstone Park, **3829,** *pictures,* **3819, 2401.**
**Gezer** (*ǧē'zĕr*) or **Gazara.** Anc. royal city of Canaan 20 mi. n.w. of Jerusalem; important frontier post in Maccabean wars; excavations have yielded a mass of material for history of Palestine, including remains of pre-Semitic aboriginal race.
**Ghadames** (*ǧă-dä'mĕs*) or **Rhadames,** town of Tripoli in an oasis of the Sahara Desert, about 300 mi. s.w. of city of Tripoli, **3105.**
**Ghat** (*ǧăt*), town and oasis of Sahara desert in s.w. Tripoli, **3104, 3105.**
**Ghats** (*ǧătz*), two mountain ranges parallel with e. and w. coasts of peninsula of India, known as Eastern and Western Ghats, **1744, 1745–6, 451;** effect on rainfall, **1747.**
**Ghats,** steps at Benares, **381, 1393.**
**Ghazni** (*ǧŭz'nĭ*), town in e. Afghanistan; strategic position on route between India and Persia; taken by English 1839 and 1842; seat of extensive empire in Middle Ages; dynasty established, **1752.**
**Ghee** (*ǧē*), clarified butter, **544.**
**Ghent** (*ǧĕnt*), Belgium, picturesque city, famous for flowers, many bridges, and relics of Middle Ages; pop. 165,000; **1456;** medieval trade center, **373.**
**"Ghent, great bombard of,"** a cannon, **636.**
**Ghent, Treaty of,** ending War of 1812 between U.S. and Gt. Brit. (1814), **3673;** Clay's part, **785.**
**Gherkin** (*ǧĕr'kĭn*), type of cucumber used for pickling, **939.**
**Ghetto** (*ǧĕt'ō*), Jewish quarter of a city, **1891.**
**Ghibellines.** *See in Index* **Guelfs and Ghibellines.**
**Ghiberti** (*ǧē-bĕr'tē*), **Lorenzo** (1378–1455), Ital. sculptor, **1456, 3156;** bronze doors for Florence Baptistery, **1848,** *picture,* **1457.**
**Ghirlandajo** (*ǧēr-län-dä'yō*), **Domenico** (1449–94), Ital. painter, greatest of a family of Florentine painters ('The Adoration of the Kings'), **2629;** Michelangelo apprenticed to, **2220.**
**Ghost flower,** or Indian pipe (plant), *pictures,* **1382, 2821.**
**Giacosa** (*ǧä-kō'sa*), **Giuseppe** (1847–1906), Ital. dramatist; chief works, **1833.**
**Giant albacore,** a tuna fish, **3552–3.**
**Giant clam, 783, 3201,** *picture,* **782.**
**Giant Mts.** (Riesengebirge), Highest range of Sudetic Mts., between

Bohemia, Czecho-Slovakia, and Silesia; highest point the Schneekoppe (5265 ft.); **270.**
**Giants:** Antaeus, **1640;** of Brobdingnag, in 'Gulliver's Travels', **3409;** Cyclops, **944;** Giant Despair in 'Pilgrim's Progress', **538;** in Norse myth., **2560;** Prometheus, **2921;** Titans, **3607.**
**Giant salamander, 3112.**
**Giant's Causeway,** natural formation of close-fitting prismatic columns of basalt rock on n. coast of Ireland, *picture,* **1809.**
**Giant spider crab, 912,** *picture,* **913.**
**Giant squirrel,** *picture,* **3334.**
**Giant water-bug, 3698.**
**Gibbon, Edward** (1737–94), Eng. historian; his 'Decline and Fall of the Roman Empire' is a monumental work of prodigious learning and brilliant style; literary associations, **1166.**
**Gibbon,** a small E. Indian ape with very long arms, **153, 154,** *picture,* **2288;** hand, *picture,* **153.**
**Gibbons, Cardinal James** (1834–1921), American Rom. Cath. churchman and public leader, **1456, 1458.**
**Gibbs, James Edward Allen** (1829–1902), Amer. inventor, b. Raphine, Va.; invents chain stitch sewing machine, **3187.**
**Gibbs, Josiah Willard** (1839–1903), Amer. physicist, b. New Haven, Conn., **2787.**
**Gibral'tar,** Brit. naval base on Mediterranean, **1458;** caves, **666;** Spanish attempt to regain, **3003.**
**Gibraltar, Strait of,** passage 40 mi. long, 9 to 15 mi. wide, between Spain and Africa, connecting Atlantic with Mediterranean; *map,* **3300.**
**"Gibraltar of America," 2948.**
**"Gibraltar of the East," 24.**
**"Gibraltar of the North Sea," 1629.**
**Gibson, Charles Dana** (born 1867). Amer. illustrator, b. Roxbury, Mass.; excels as portrayer of society life; creator of the "Gibson girl"; since 1920 chief owner and managing head of *Life.*
**Gibson, John** (1790–1866), Eng. sculptor, b. Conway, Wales; introduced color after Gk. fashion in tinted 'Venus' ('Sleeping Shepherd'; 'Mars and Cupid'; statue of Queen Victoria for houses of Parliament); **3158.**
**Gibson, Wilfrid Wilson** (born 1878), Eng. poet ('Stonefolds'; 'Borderlands'; 'Neighbors'—depicting inner life of working people), **1167.**
**Gid'eon,** religious reformer, judge, and mighty warrior; deliverer of Israel from the Midianites (Judg. vi–viii); **1890, 2645.**
**Giffard', Henri** (1825–82), Fr. engineer, invented dirigible balloon run by steam, **313.**
**Gig-headed snipe, 3779–80.**
**Gijon** (*hē-hōn'*), Spain. Port for rich mining district in center of n. coast on the Bay of Biscay; pop. 55,000; watering place.
**Gila Desert,** Ariz., **3580,** *picture-map,* **201.**
**Gila monster, 2037, 202,** *picture,* **2037.**
**Gila River,** broad and shallow stream 550 mi. long; rises in Sierra Madre Mts. in s.w. N.M. and crosses Ariz. to Colorado R.; **202, 3588,** *map,* **3584–5.**
**Gilbert, Cass** (born 1859). One of foremost Amer. architects, b. Zanesville, Ohio; designer of many famous buildings, including the Minnesota capitol, and the Woolworth building and U.S. Custom House (New York City); planned U. of Minnesota and U. of Texas.
**Gilbert, Sir John** (1817–97), Eng. painter and illustrator; great historic themes of vigorous design and color; *pictures,* **1635, 1681.**
**Gilbert, Sir Humphrey** (1539?–83), Eng. navigator; seeking the Northwest Passage (1583), took possession of Newfoundland for Queen Elizabeth; lost at sea on return voyage; **2975, 2450.**
**Gilbert, William** (1544–1603), Eng. scientist, called "father of electric science," **2122, 1117,** *picture.* **1119.**
**Gilbert, Sir William S.** (1836–1911), Eng. humorist and playwright ('Pinafore', 'The Mikado', and other comic opera librettos set to music by Sir Arthur Sullivan; 'Bab Ballads'), **2584.**
**Gilbert Islands,** Brit. group of coral isls. on equator in mid-Pacific; 166 sq. mi.; pop. 27,000; **2620,** *map,* **2624–5.**
**Gilbert Peak,** in Uintah Mts., Utah, **3036,** *map,* **3610.**
**Gil Blas** (*zhēl bläs*). Hero of one of the world's great picaresque novels, 'The Adventures of Gil Blas de Santillane', by Le Sage.
**Gilbo'a,** mt. range in Palestine, scene of battle in which Saul and Jonathan were slain, **967.**
**Gilder, Richard Watson** (1844–1909). Amer. poet and editor, b. Bordentown, N.J. ('Five Books of Song').
**Gilds, 1459–60;** apprentice system, **3655;** drama of Middle Ages, **1033;** in Florence, **1293;** Freemasonry, **1361.**
**Gilead** (*gĭl'ē-ăd*), anc. name for mountainous but fertile dist. in Palestine, **2645.**
**Giles** (*jīls*), **Saint** (6th cent.? A.D.). Patron saint of beggars and cripples; hermit and Benedictine abbott of France.
**Gil'gal.** Anc. city in Jordan valley between Jericho and river, where Israelites first encamped after crossing the Jordan (Josh. iv).
**'Gilgamesh** (*gĭl'gä-mĕsh*), **Epic of', 300.**
**Gill** (*jĭl*), a unit of measure, **3715.**
**Gillette** (*jĭ-lĕt'*), **William** (born 1855). Amer. actor and playwright, b. Hartford, Conn.; best known for his work in 'Sherlock Holmes' and 'The Admirable Crichton'; latterly appeared almost exclusively in his own productions ('Secret Service'; 'Clarice').
**Gill-net, 1284,** *picture,* **1285.**
**Gillot, Joseph** (*jĭl'ŏt*) (1799–1873), Eng. manufacturer of steel pens, **2710.**
**Gills** (*jĭls*), organs for breathing under water, **2998;** in bivalve mollusks, **2280, 2612, 2614;** in crawfish, *picture,* **915;** in fish, **1274, 1271, 1272;** appear in all embryo vertebrates, **3634, 1141, 1209;** in tadpoles of frogs and toads, **1373, 3507;** in water crabs, **912;** in water snails, **3256.**
**Gilman, Daniel Coit** (1831–1908). Amer. scholar and educator, b. Norwich, Conn.; pres. of U. of California and first pres. of Johns Hopkins Univ. and of Carnegie Institution.
**Gil'pin, John,** in Cowper's 'John Gilpin's Ride', a linen-draper who has many ludicrous adventures on horseback, **910, 911.**
**Gimbal** (*jĭm'bal*), in compass mountings, **854.**
**Gin,** a liquor, **84.**
**Gin, cotton,** a machine, **902;** Whitney invents, **3735–6,** *picture,* **3735.**
**Ginger,** a spice, **1460, 3317, 3318;** *picture,* **3319;** Jamaica export, **1859.**
**Gingham, 904.**
**Ginkgo** (*jĭnk'jō*), or maidenhair tree, **1460, 3533.**
**Ginseng** (*jĭn'sĕng*), a plant, **1460–1,** *pictures,* **1460–1.**
**'Gioconda** (*jō-kôn'dä*), **La'** or **'Mona Lisa',** painting by Leonardo da Vinci, **3644,** *picture,* **1203.**
**Giolitti** (*jō-lēt'tē*), **Giovanni** (born 1842). Ital. statesman; several times premier of Italy; opposed Italy's participation in World War.
**Giorgione** (*jôr-jō'nā*), or **Giorgio Barbarelli** (1478–1510), Ital. painter, **2630.**
**Giotto** (*jŏt'tō*) **di Bondone** (1267?–1337), Ital. painter, sculptor, and architect, **1461–2, 2628;** tower in Florence, **1847–8, 1461, 1293,** *pictures,* **1462, 1834, 1294;** portrait of Dante, **958;** fresco at Padua, *picture,* **2631.**
**Giovanni** (*jō-vän'nē*) **de' Medici** (d. 1429), Florentine merchant; founded greatness of de' Medici family; **2191.**
**Gipsies, 1462–3;** Hungarian, **1702;** music inspires Liszt, **2026.**
**Gipsy-moth, 548.**
**Giraffe, 1463–4,** *picture,* **1464;** common ancestry with hippopotamus, **1336;** foot, *picture,* **1323;** horns, **1680.**
**Giralda** (*hĭ-räl'dä*), a bell tower at Seville, **3182.**
**Girard** (*jĭ-rärd'*), **Stephen** (1750–1831), Amer. merchant, banker, and philanthropist, **2761.**
**Girard College, 2761.**
**Girder bridge, 506.**
**Gir'ga,** Egypt, town and former cap. of Upper Egypt, on Nile, 300 mi. below Cairo; pop. 20,000; **1094.**
**Girgenti** (*jĭr-jĕn'tē*), city near s. coast of Sicily; pop. 27,000; famous ruins of Gk. temples; anc. Agrigentum; **3230.**
**Girl Scouts, 1464–5.**
**Gironde** (*zhē-rônd'*) **River,** estuary in s.w. France, 45 mi. long, **1345,** *map,* **1351;** route to Bordeaux, **466.**
**Girondists** (*jĭ-rŏn'dĭsts*), political party of Fr. Rev.; advocated moderate republicanism; **466, 1859, 3039.**
**Girty** (*gĕr'tĭ*), **Simon** (1741–1818). Amer. revolutionary renegade and Indian leader, to whom are attributed innumerable atrocities.
**Gis'sing, George Robert** (1857–1903). Eng. realistic novelist who chiefly depicted the struggling life of the shabby-genteel, and the conflict between education and circumstances ('The New Grub Street'; 'The Whirlpool'; 'The Private Papers of Henry Ryecroft'; 'The Odd Women').
**Gist, Christopher.** Amer. scout; explored Ohio valley 1749–52; said to have saved Washington's life while crossing Allegheny R.
**Gitch'e Gu'mee,** Indian name for L. Superior, **2059, 2060.**
**Gitschin** (*gĭ-chēn'*) or **Jic'in.** Town in Bohemia, Czecho-Slovakia, 48 mi. n.e. of Prague; Prussian victory over Austrians 1866.
**Giuliano** (*jo͞o-lē-ä'nō*) **de' Medici** (1453–78), younger brother of Lorenzo de' Medici, **2191.**
**Giuliano de' Medici** (1479–1516), duke of Nemours, 3d son of Lorenzo; statue by Michelangelo, **1293,** *picture,* **3159.**
**Giulio Romano** (*jo͞o'lē-ō rō-mä'nō*) (1492?–1546), Ital. painter and architect (Fr. form of name Jules Romain); pupil, assistant, and successor of Raphael as head of Rom. school of painting; 'Dance of Apollo and the Muses', *picture,* **156.**
**Giurgevo** (*jo͞or-jā'vō*) or **Giurgiu** (*jo͞or'jo͞o*), Rumania. Port of Bucharest 35 mi. s. on Danube R.; pop. 15,000; engagements in Russo-Turkish wars.
**"Give me liberty, or give me death," 1638.**
**Gizeh** (*gē'zĕ*), also **Giza, Ghizeh,** Egypt, town on Nile nearly opposite Cairo; pop. 19,000; Great Pyramids, **2939, 1100, 568–70,** *pictures,* **1094, 2939, 2940;** sphinx, **3316–7, 1100.**
**Gizzard,** the last and most important of a bird's three stomachs;

has muscular walls and grinds food with aid of gravel in seed and grain eaters; merely a membranous sac in carnivorous birds; discharges prepared food for absorption into intestine; **400.**

**'Gjöa',** Amundsen's ship, **120, 2863–4.**

**Glace** (*glās*) **Bay,** Nova Scotia. Coal-mining and shipping center on n.e. coast of Cape Breton Isl. 15 mi. e. of Sydney; pop. 17,000; large fishing industry; wireless station.

**Glacial Period** or **Ice Age, 1720–1;** in N. Amer., **2516, 3768, 3770, 2253.**

**Glacier,** a moving ice field, **1465–6, 2788, 1957, 1362,** *pictures,* **2789, 602;** Agassiz's studies, **41;** Alaska, **76, 77;** bird migration, **2232;** Caucasus, **664;** greatest of Europe, **2532;** Greenland, **1540;** forms icebergs, **1721;** Switzerland, **3417–21, 101.**

**Glacier National Park,** in Mont.; 1450 sq. mi.; **1466, 1465, 2400,** *pictures,* **2402, 1764.**

**Glacier Park,** Brit. Columbia, in the Selkirk Mts.; 468 sq. mi.; series of caverns called Nakimu Caves; **2400.**

**Glacier Peak,** in northern part of Cascade Range, Wash.; 10,436 ft.; **3687.** Also mt. in n.-cent. Colo.; height 12,654 ft.

**Gladden, Washington** (1836–1918). Amer. clergyman, social reformer, and author, b. Pottsgrove, Pa.; led attack on "tainted money" and opposed alliance of church with "predatory wealth"; urged personal responsibility of every citizen for good govt.

**Gladiator** (*glăd'i-ā-tôr*), professional fighter in anc. Rome, **1466,** *picture,* **1467;** Colosseum, *picture,* **181.**

**Gladiolus** (*glā-dī'ō-lŭs*), flower, **1466.**

**Gladstone, William Ewart** (1809–98), Brit. statesman, **1466, 1468–9;** anecdote, **1598;** attitude on Civil War, **781;** rivalry with Disraeli, **1013;** on Gordon, quoted, **1439;** Irish question, **2689, 2690, 1811;** as a Liberal, **2869;** S. African policy, **3280;** and Victoria, **3640, 1013.**

**Glamorganshire** (*glā-môr'găn-shēr*). Southernmost county of Wales; 811 sq. mi.; pop. 1,120,000; cap. Cardiff; great coal beds, iron mfrs.; cattle, sheep, hogs.

**Gland,** in human body, **1469–70;** kidneys, **1922;** liver, **2031;** sebaceous, **3246;** sweat, **3246.**

**Glanders.** An infectious disease, common among horses and asses, less frequently attacking cattle and other live stock; ulcers, pus discharge from lungs, and high temperature are characteristics.

**Glarus** (*glą'rus*), cap. of Swiss canton of same name, 43 mi. from Zurich; pop. 5000; cotton mills, breweries; **3416.**

**Glas'gow,** largest city of Scotland; pop. 1,110,000; on Clyde R.; **1470, 3146, 3149.**

**Glasgow, University of.** Founded 1451 by Bishop Turnbull; co-ed. since 1893; retains many medieval customs, including student election of rector; faculties of arts, science, medicine, divinity, law; **832, 1470.**

**Glass, 1471–4;** Bohemian, **270, 2912;** buttons, **550;** chemical processes, **10, 220, 755;** Egypt (anc.), **1100;** gold used, **1482, 1472;** melting point, **1362;** mirrors, **2261;** Ohio, **2570;** optical instruments, **3462–3, 1986–7,** *picture,* **1987;** Phoenician, **2774, 1471;** refracts light, **2000;** salt compounds used, **3116;** sand and silica, **3123, 3233, 1383;** U.S., **2813, 1474;** Venetian, **1840.**

**Glass-rope sponge, 3330,** *picture,* **3328.**

**Glass-snake, 2037,** *picture.* **2036.**

**Glastonbury** (*glăs'tŏn-bĕr-ĭ*), England. Town in Somersetshire, on Brue R., 22 mi. s. of Bristol; ruins of 12th cent. abbey; "Glastonbury thorn," a variety which flowers twice a year, said to have sprung from a specimen planted by Joseph of Arimathea, who built here the first Christian church in England.

**Glauber** (*glą'bĕr*), **Johann Rudolf** (1604–68). Ger. chemist, discovered (1658) Glauber's salt.

**Glauber's salt,** found in large quantities in Utah, Austria, Italy, and Spain; small quantity in blood; **3116.**

**Glau'conite** or **greensand,** a soft olive-green mineral, **2460, 2900.**

**Glaucous** or **pussy willow, 3742–3.**

**Glaze,** in pottery, **2905, 2903, 2906,** *picture,* **2907;** enameling, **1145–8.**

**Glen'coe,** Scotland. Glen 60 mi. n.w. of Glasgow; wild scenery; massacre of Macdonalds by royal troops 1692.

**Glendale,** Calif. Residential suburb 7 mi. n. of Los Angeles; pop. 13,536; oranges and olives grown in vicinity.

**Glendower** (*glĕn'dou-ēr*), **Owen** (1359?–1415?), Welsh chief, national hero; last independent Prince of Wales and leader of last war for Welsh independence; **3664.**

**Glens Falls,** N.Y. Mfg. city 47 mi. n. of Albany on Hudson R.; pop. 16,638; makes shirts and collars, paper, cement; limestone and black marble quarries near by; falls and famous cave described in Cooper's 'The Last of the Mohicans'.

**Glenwood Springs,** Colo., city 60 mi. n.w. of Leadville; pop. 2073; health resort, **845.**

**Glinka** (*glĭn'kä*), **Michael Ivanovich** (1803–57). Pioneer of modern Rus. school of national music.

**Globe, Ariz.** Copper-mining and smelting city and cattle market, about 80 mi. n. of Tucson; pop. 7044.

**Globe Theater,** old playhouse in London, **3190,** *picture,* **3191.**

**Glockenspiel** (*glŏk'ĕn-spēl*). Same as **Carillon.**

**Glommen River,** Norway. Largest river in Scandinavian peninsula; rises in Dovrefjeld tableland and flows s. 350 mi., entering Skaggerrak 50 mi. s.e. of Christiania.

**Glon'oin,** term for nitroglycerin in medicine, **1050.**

**Gloos'kap,** a demi-god in myth. of N. Amer. Indians, **611, 614–5;** and the whale (story), **3727–9.**

**Gloriana** (*glō-rĭ-ā'nà*). In Spenser's 'Faerie Queene', the queen of Fairyland; personification of glory and representation of Elizabeth as queen.

**"Glorious Revolution of 1688,"** in Eng. history, **1861.**

**Gloucester** (*glŏs'tĕr*), English city on Severn R., 114 mi. n.w. of London; pop. 46,000; originally a Rom. camp; noted cathedral of Norman-Gothic architecture; varied industries; first Sunday School founded, **3395.**

**Gloucester,** Mass., leading fishing port in U.S. and one of largest in world, on Cape Ann, 27 mi. n.e. of Boston; pop. 22,947; fish market, **1283, 2166.**

**Gloucester City,** N.J. Mfg. city on Delaware R. opposite Philadelphia; pop. 12,162; yarns, rugs, paper, boats, tools, drills.

**Gloucestershire** (*glŏs'tĕr-shēr*). County in s.w. England at head of Severn estuary; 1243 sq. mi.; pop. 750,000; dairying, woolen mfg.; cap. Gloucester.

**Glover, George W.** (d. 1843), first husband of Mary Baker Eddy, **1080.**

**Gloversville,** N.Y., in e.-cent. part of state, 40 mi. n.w. of Albany; pop. 22,075; leading mfg. city for gloves in U.S.; large tanneries, textile mills, woodenware factories; **1475.**

**Gloves, 1474–5;** preparation of leather, **1975–9.**

**Glowworms, 1262–3;** phosphorescence, **2776.**

**Gloxin'ia.** A small genus of tropical Amer. plants of the family *Gesneraceae;* large bell-shaped flowers of red, purple, white, or intermediate shades; the cultivated gloxinia of hothouses belongs to a closely related genus, *Sinningia,* a native of Brazil.

**Glucinum** (*glų-sī'nŭm*), a metallic chemical element, **4042.**

**Gluck** (*glŭk*), **Alma** (born 1886). Amer. dramatic soprano, b. Rumania; attained operatic and concert success without European training; married Efrem Zimbalist.

**Gluck, Christoph Willibald** (1714–87), Ger. composer; earliest of great modern opera writers, and first to make opera truly dramatic, suiting the music to the character by whom it is sung; **2381.**

**Glucose** (*glų'kōs*), **1475, 3388.**

**Glu'coside,** a complex vegetable substance; colors leaves in autumn, **1982.**

**Glue, 1475–6;** in calcimine, **2642.**

**Gluten** (*glų'tĕn*), a tough, elastic albuminous substance; in bread, **498;** in corn, **890;** lacking in barley, **331;** in macaroni, **2093;** a protein, **2926;** in wheat flour, **1302.**

**Glutton,** an Old World wolverine, **3776.**

**Glyc'erin** or **glycerol, 1476;** base of nitroglycerin, **1050;** formed during digestion, **1011;** in soap-making, **3267.**

**Glycogen** (*glī'kō-ġĕn*), formed by liver, **2031.**

**Glyp'todon** (Greek, "fluted tooth"). A very large extinct armadillo-like animal of S. Amer.; attained size of an ox; had very strong limbs with short broad feet; teeth were deeply grooved or fluted.

**Gnat** (*năt*), a popular term for various small insects, **1476, 1313.**

**Gnatcatcher,** a bird of the kinglet family, **1926.**

**Gneiss** (*nīs*), an igneous rock, **1230.**

**Gnôme engine, 1406, 58,** *picture,* **65.**

**Gnomes** (*nōmz*), **1219.**

**Gnos'sus.** Same as **Cnossus.**

**Gnu** (*nų*), an antelope, **146.**

**Goa** (*gō'à*), Port. possession on Malabar coast of India; 60 mi. long, 30 mi. wide; conquered by Albuquerque in 1510; pop. 515,000; **1756,** *map,* **232–3.**

**Goat, 1476–7;** altitude range, *picture,* **397;** care of as pet, **2756;** fur, **1390;** ibex, **1719;** leather, **1977, 1097, 1475;** milk, **2238;** related to sheep, **3198, 3199.**

**Goat,** a sign of the zodiac, **3840.**

**Goat, Rocky Mountain,** an antelope, **146,** *picture,* **147;** not a bighorn, **392.**

**Goat Island,** in Niagara R., **2502.**

**Goatskin, 1977.**

**Goatsucker family** of birds (*Caprimulgidae*), **2508, 3733.**

**"Gob,"** slang expression for sailor, **3248.**

**Gobelin** (*gō-bĕ-lăn'*) **tapestry, 3434.**

**Gobi** (*gō'bē*) or **Shamo** (*shä-mō'*), desert region in cent. China; 260,000 sq. mi.; elevation 3000 to 5000 ft.; **228, 2285,** *picture,* **227;** *maps,* **740, 2624–5;** cities buried under sands, **3122;** part of vast desert chain, **3104;** wild camels, **591.**

**Goby,** or mud-skipper, an E. Indian fish. **2364.**

**Godavari** (*gō-dä'vą-rĭ*). Large r. in s. India; rises n.e. of Bombay in W. Ghats, flows 900 mi. s.e. enter-

ing Bay of Bengal by 7 mouths; navigable for 300 mi.
**Godfrey of Bouillon** (*bụ-yôn'*) (1060?–1100), leader in First Crusade, and first Christian ruler of Jerusalem; hero of Tasso's 'Jerusalem Delivered'; **929, 930.**
**Godiva** (*gō-dī'vȧ*), **Lady** (11th cent.), legendary Eng. heroine, **910.**
**Godkin, Edwin Lawrence** (1831–1902). Amer. journalist and author, b. in Ireland; editor of New York *Evening Post* and *The Nation;* vigorously opposed political corruption.
**Godoy** (*gō-thō'ī*), **Manuel de** (1767–1851). Span. duke of Alcudia and Prince of the Peace, favorite of Charles IV and his queen; virtually dominated Spain during the imbecile king's reign.
**'God Save the King'**, Brit. national song, **2404.**
**God'win, Mary Wollstonecraft** (1759–97). Eng. women's rights advocate ('Vindication of the Rights of Woman'); wife of William Godwin, a political philosopher and novelist; mother of Shelley's wife, Mary.
**Godwit,** a curlew-like shore bird of the snipe family, *picture,* **2411.**
**Goethals** (*gō'thălz*), **George Washington** (born 1858), Amer. army officer and engineer, **1477;** Panama Canal, **2653–4.**
**Goethe** (*gû'tĕ*), **Johann Wolfgang** (1749–1832), Ger. poet, novelist, and philosopher; the greatest figure in Ger. literature, **1477–8, 1438, 2541;** birthplace and boyhood, **1357;** 'Faust', **1228;** friendship with Schiller, **3137;** home in Weimar, **3715;** statue in Rome, *picture,* **1437.**
**Goffe** (*gŏf*), **William** (1605?–1680?), one of judges who signed death warrant of Charles I of England; fled to Amer., **2456.**
**Gog and Ma'gog.** Heathen prince and people (Ezek. xxxviii–xxxix); in Brit. legend, two giants whose effigies are kept in London Guildhall.
**Go'gol, Nicholas Vasilievich** (1809–52), Rus. novelist and dramatist; called "father of modern Russian realism"; **3097, 3098;** influence on modern novel, **2541.**
**"Going to Jerusalem,"** a game, **2837.**
**Goiter** (*goi'tĕr*), an enlargement of the thyroid gland, **1469.**
**Golconda** (*gŏl-kŏn'dȧ*), India. Ruined city 5 mi. w. of Hyderabad; famous as diamond-cutting center in 16th cent.; name hence used to mean a mine of wealth.
**Gold, 1479–82;** alloys, **1480–1;** Australia, **264, 2194–5;** Canada, **3836, 1933, 512, 513;** chemical and physical properties, **1481–2, 2510, 1362;** crystal, *picture,* **935;** currency, **2281–4;** India, **1751, 1752, 1479;** industrial uses, **1482, 1472, 2710, 3757;** Japan, **1868;** Mexico, **2210;** mining and refining, **1479–80, 2248–50, 944, 1125;** *pictures,* **265, 1039, 2249;** Russia, **3607, 1479;** Siberia, **3228;** S. Africa, **1895, 3281, 3283, 3527;** S. Amer., **3289, 494, 836;** Tibet, **3496.** —*U.S. resources.* **3590, 2515;** Alaska, **74;** Calif., **578, 582, 581, 3103;** Colo., **839, 841, 844;** Nev., **2445;** S.D., **3296–7;** Va., **3650.**
**Gold-beating, 1481.**
**Gold certificates,** money, **2282.**
**Gold chloride, 1482.**
**Gold Coast,** Brit. colony in W. Africa extending 334 mi. along Gulf of Guinea; 80,000 sq. mi., including Ashanti and N. Territories; pop. 1,506,000; cap. Accra; **513, 562, 33,** *maps,* **40–1.**
**Golden,** Colo. City 14 mi. w. of Denver; pop. 2484; smelting and reduction works; Colorado School of Mines.
**Golden Age,** of Athens, **2729;** of Ital. literature, **1833;** of Latin literature, **1966;** of Saturn, **3129.**
**Golden apple,** awarded by Paris to Aphrodite, **2680, 3542.**
**Golden apples of Hesperides,** in Gk. myth., obtained by Hercules, **1640.**
**Golden Bull,** originally any charter with golden seal or *bulla;* especially, edict issued 1356 by Emperor Charles IV, **1675, 1447–8, 1357.**
**Golden Calf.** Image made by Israelites from their earrings at instigation of Aaron while Moses was absent on Mount Sinai receiving the Ten Commandments (Exodus xxxii).
**Golden Circle, Knights of the, 781.**
**Golden eagle, 1053, 1055, 1220.**
**Golden Fleece,** sought by the Argonauts, **193, 1479.**
**Golden Fleece, Order of, 979, 518.**
**Golden Gate,** channel about 2 mi. wide at entrance to San Francisco Bay, Calif., **3124,** *picture,* **576.**
**'Golden Hind',** Drake's ship, **1030.**
**Golden Horde,** Tatars who overran Russia in 13th cent., **2285, 3039;** effect on Rus. literature, **3096.**
**Golden Horn,** harbor of Constantinople, **468,** *picture,* **871.**
**Golden plover, 2839, 2231–2,** *map-picture,* **2232.**
**Goldenrod,** a flowering autumn plant, **1483.**
**Golden Rose,** a papal honor, probably established in the 11th cent., **979.**
**Golden Rule.** "Whatsoever ye would that men should do to you, do ye even so to them, for this is the law and the prophets" (Matthew vii, 12, and Luke vi, 31).
**Golden State, 576.**
**Goldfield,** Nev., mining town in s. Nev.; pop. 1538; **2445, 2446.**
**Goldfinch** or **wild canary, 1241,** *pictures,* **418, 1241;** lined nest, **406.**
**Goldfish, 1483, 1277.**
**Gold lace, 1482.**
**Gold leaf, 1481–2.**
**Gold-leaf electroscope, 1110,** *pictures,* **1110, 1112.**
**Goldmark, Karl** (1832–1915). Hungarian composer; 'Spring' and 'Prometheus Bound' are his best known overtures; 'Rustic Wedding', a delightful symphony; 'The Queen of Sheba', his first and best opera.
**Goldoni** (*gōl-dō'nē*), **Carlo** (1707–93). Ital. dramatist, founder of modern Ital. comedy; 'The Coffee House' and 'Pamela' are his best; also wrote several successful plays in French.
**Goldsboro,** N.C. Commercial center of tobacco and cotton-growing region on Neuse R., 48 mi. s.e. of Raleigh; pop. 11,296; cotton and lumber products, oil, veneers.
**Goldschmidt** (*gōlt'shmĭt*), **Jenny Lind.** *See in Index* **Lind, Jenny.**
**Goldsmith, Oliver** (1728–1774), Eng. novelist, essayist, and poet, author of 'The Vicar of Wakefield', **1483–4, 1036, 1166;** and Dr. Johnson, *picture,* **1899;** in London, **2053.**
**Gold standard,** use of gold alone for standard money, as opposed to bimetallic use of gold and silver, **2281–2;** in U.S., **1611, 791, 2104.** *See also in Index* **Silver, free coinage of.**
**Golf, 1484–7.**
**Golgotha** (*gŏl'gō-thȧ*) or **Calvary,** place near Jerusalem where Christ was crucified, **1886, 1888.**
**Goli'ath,** Philistine giant (I Sam. xvii), **967.**
**Goliath beetle, 368.**
**Goltz, Colmar, Freiherr von der** (1843–1916). Prussian general and military writer; reorganized Turk. army 1883–95; gov.-gen. of Belgium, 1914; commanded Turk. army in Mesopotamia 1915–16 ('War History of Germany in 19th Century'; 'The Nation in Arms').
**Gomel,** Russia. Same as **Homel.**
**Gomez** (*gō'mās*), **Juan Vicente** (born 1859), pres. of Venezuela; successful in extricating Venezuela from foreign complications created by Castro, **3623.**
**Gomez y Baez** (*ē bä'ās*), **Maximo** (1831?–1905). Cuban patriot general; commander-in-chief (1895–98) in second insurrection against Spain.
**Gompers, Samuel** (born 1850), Amer. labor leader, **1487.**
**Goncharof** (*gŏn-chȧ-rôf'*), **Ivan Alexandrovitch** (1812–91). Rus. novelist, wrote 'Oblomof', "masterpiece which ranks with the best work of Tolstoi and Turgenief," which gave Russia the term "Oblomofism" as a synonym for diseased will and indolence.
**Goncourt** (*gôn-kụr'*), **Edmond de** (1822–96). Fr. novelist and historian; in collaboration with his brother Jules (1830–70) wrote minute valuable studies of Fr. society in 18th cent.; novels continued naturalistic method of Flaubert and taught Zola ('Germinie Lacerteux', called "the clinic of love"; 'Renée Mauperin', a convincing story of young Parisian society girl).
**Gondar** (*gŏn'där*). Religious center and former cap. of Abyssinia, Africa, in the n., 25u mi. from Red Sea; pop. 3000.
**Gondoko'ro,** Egypt, village on Upper Nile; formerly center of slave and ivory trade; **1092.**
**Gon'dola,** long narrow Venetian boat, **3623,** *pictures,* **3624, 517.**
**Gonds,** an aboriginal race of India, who maintained independence until 18th cent.; present Central Provinces correspond roughly to their kingdom; **1748.**
**Gon'eril,** one of King Lear's two cruel daughters, in Shakespeare's tragedy, **1926.**
**Goniom'eter,** radio appliance, *pictures,* **3761.**
**Gonzales** (*gŏn-zä'lĕz*), **Manuel** (1833–93). Mex. general, close friend of Diaz, whom he aided in revolution of 1876; succeeded Diaz as pres. 1880–84, when he resigned in his friend's favor; brilliant general but poor administrator.
**Goober,** a peanut, **2700–1.**
**Good Friday, 1070.**
**"Good Gray Poet," 114.**
**Good Hope, Cape of.** *See in Index* **Cape of Good Hope.**
**"Good name, in man or woman," 2604.**
**"Good Queen Bess," 1136.**
**Goodwin, Nat C.** (1857–1919). Amer. actor, one of the most popular of his day, known for his dry, humorous characterizations; five times married, four times divorced; wrote 'Why Beautiful Women Marry Nat Goodwin'.
**Goodwin Sands.** Dangerous shoals at entrance to Straits of Dover, scene of many wrecks; its shifting sands separated from mainland by the Downs.
**Goodyear, Charles** (1800–60), Amer. inventor, b. New Haven, Conn.; discoverer of process of vulcanizing rubber and holder of 60 patents on rubber processes which others infringed; **3072.**
**Goodyear welt, 3222.**
**Goofah,** circular basket-like boat, **445,** *picture,* **443.**
**Goose, Elizabeth,** supposed original of "Mother Goose," **2340.**
**Goose, 1487–8;** bred for feathers, **1229;** duration of life, **126;** hatching period, **408;** nest, *picture,* **2411;** pasturing in Europe, **2910.**

**Gooseberry,** 1488; harbors rust, 3099.
**Goosefoot family** of plants, 3940.
**Gopher** (*gō'fẽr*), an Amer. rodent, 1488–9; resembles chipmunk, 752.
**Gopher State,** 3347.
**Gopher tortoise,** 3562.
**Gorboduc** (*gôr'bō-dŭk*). Mythical king of Britain; subject of first Eng. tragedy. *See in Index* **Dorset.**
**Gor'dian knot,** 86.
**Gordon, Adam Lindsay** (1833–70), one of most popular and distinctive of Australian poets, 268.
**Gordon, Gen. Charles George** (1833–85), Brit. army officer ("Chinese Gordon"), 1489, 749, 1929.
**Gordon, Charles W.** *See in Index* **Connor, Ralph.**
**Gordon, Lord George** (1751–93). Eng. agitator; headed anti-Catholic movement which resulted in "Gordon Riots" of 1780.
**Gordon, John Brown** (1832–1904). Amer. Confederate general, later governor of and senator from Ga.; b. Upson County, Ga.
**Gorgas** (*gôr'gȧs*), **William Crawford** (1854–1920), Amer. army officer and sanitary engineer, 1490–1; Panama Canal, 2653–4.
**Gorge,** defined, 2791.
**Gorges** (*gôr'ġĕs*), **Sir Ferdinando** (1566?–1647), Brit. colonist, founder of Maine, called "father of English colonization in America"; 2129, 2456.
**Gorgias** (*gôr'ġĭ-ȧs*) (about 480–380 B.C.). Gk. orator and sophist noted for florid eloquence; one of Plato's dialogues is named for him.
**Gorgons** (*gôr'ġŏnz*), in Gk. myth., three female monsters, 2731, 2732.
**Gorgonzo'la.** Town in Lombardy, Italy, center of cheese-producing district.
**Gorgonzola cheese,** 709.
**Goril'la,** the largest of the apes, 1491, *pictures,* 142, 1491; evolutionary position, *diagram,* 128; hand, *picture,* 153; resemblances to man, 153, 154.
**Gorizia** (*gō-rēt'sē-ä*) (Austrian Görz or Göritz), Italy, 20 mi. n.w. of Trieste; pop. 30,000; cap. of former Austrian crownland of Gorizia and Gradisca; ceded to Italy by Treaty of Rapallo (1920); Italians capture, 3795.
**Gorky** (*gôr'kĭ*), **Maxim,** pen name of Alexis Peshkof (born 1868), Rus. revolutionist, short-story writer, and novelist, 3097; chief works, 3098, 1038.
**Görlitz** (*gûr'lĭts*), Germany. Wealthy industrial town of Silesia on Neisse R., 55 mi. e. of Dresden; pop. 80,000; fine Renaissance architecture.
**Gorm the Old** (860?–935?), king of Denmark, 997.
**Gortyna** (*gôr-tĭ'nȧ*). Largest and most powerful city of anc. Crete, next to Cnossus; near center of isl.
**Gos'hawk,** 1605, 1606.
**Goshen** (*gō'shĕn*). The region in Egypt occupied by the Israelites, w. of modern Suez Canal (Gen. xiv, 10).
**Goslar,** Germany, walled town in Hanover; celebrated millenary 1922; pop. 18,000; 1595.
**Gos'nold, Bartholomew** (d. 1607), Eng. navigator, explorer of New England, leading colonist of Jamestown, Va.; died there; discovers Cape Cod, 640.
**Gospels,** four books of New Testament giving account of life and teachings of Jesus Christ, 1887.
**Gosse** (*gŏs*), **Edmund** (born 1849). Eng. poet and critic, son of P. H. Gosse ('Father and Son'; 'History of Modern English Literature').
**Gosse, Philip Henry** (1810–88). Eng. naturalist ('The Ocean'; 'The Romance of Natural History').
**Gossip's bridle,** an instrument of torture, *picture,* 2919.
**Göta** (*yû'tȧ*) **Canal,** in Sweden, 3403.
**Götaland,** a province of Sweden, 3402–3.
**Gotama** (*gō'tȧ-mȧ*) or **Gautama,** family name of Buddha, 524–5.
**Göteborg** (*yû'tĕ-bôrĸ*), also **Gothenburg, Gottenburg,** 2d city, chief port, and important mfg. center of Sweden, on s.w. coast at mouth of Göta R.; pop. 200,000; 3403; liquor regulation, 3404.
**"Go, tell the Spartans," 2740.**
**Gotha** (*gō'tȧ*), Germany. Mfg. town on Leine canal, 80 mi. s.w. of Leipzig; pop. 42,000; formerly joint cap. with Coburg of Duchy of Saxe-Coburg-Gotha; Friedenstein Castle.
**Go'tham.** A village in Nottinghamshire, England, inhabitants of which are said to have played the fool in order to dissuade King John from settling there and burdening them with expense of royal residence; hence called "Wise Men of Gotham." Also nickname of New York City from alleged pretensions of its people to wisdom; first used by Irving in 'Salmagundi' (1807).
**Gothenburg** (*gŏt'ĕn-bûrg*). Same as **Göteborg.**
**Gothic alphabet,** 1435, 1436, 1491.
**Gothic architecture,** 181–8, 662, 1198.
**Gothic language,** 1435, 1436.
**Goths,** 1491–2, 1194–5; original home, 3402. *See also in Index* **Visigoths.**
**Got'land** or **Gothland,** largest isl. in Baltic Sea, e. of Sweden, to which it belongs; 1142 sq. mi.; farming, stock-raising; 3402.
**Got'tenburg.** Same as **Göteborg.**
**'Götterdämmerung'** (*gû̇t-ĕr-dĕm'ĕr-ung*), opera by Wagner, 3663.
**Göttingen** (*gû̇t'ĭng-ĕn*), Germany. Town 60 mi. s. of Hanover; pop. 38,000; noted univ., Georgia Augusta, founded by George II, with richest library of modern literature in Germany.
**Gottschalk** (*gŏt'shälk*), **Louis M.** (1829–69). Amer. pianist and composer, b. New Orleans, La.
**Gouch'er College.** At Baltimore, Md.; women; founded 1884 under Meth. Episc. church as Woman's College of Baltimore (opened 1888); changed name 1910; arts and sciences; course for teachers in coöperation with Johns Hopkins; 322.
**Gouges** (*gōozh*), **Olympe de** (1748–93), a Fr. pioneer of feminism; guillotined for defending Louis XVI; treatise on women's rights, 3778.
**Gough** (*gŏf*). **Sir Hubert** (born 1870). Brit. general, commanded Fifth Army during Ger. Somme offensive, March 1918; made scapegoat for failure of his superiors to give him adequate support.
**Gough, John B.** (1817–86). Amer. temperance lecturer, b. England; popular for his earnest but amusing addresses.
**Gouin, Sir Lomer** (born 1861). Canadian statesman; premier of Quebec 1905–20; Dominion minister of justice 1921.
**Goujon** (*gōo-zhôn'*), **Jean** (1520?–66?). Fr. Renaissance sculptor and architect; best known works are his 'Diana' and the gallery for musicians in the Louvre.
**Gould, Helen Miller.** *See in Index* **Shepard, Helen Gould.**
**Gould, Jay** (1836–92). Amer. self-made capitalist, b. Roxbury, N.Y.; early associate of Daniel Drew and "Jim" Fiske in manipulating Erie r.r. stocks; gained mastery over what became the Gould system of roads; with Fiske tried to corner gold market causing "Black Friday" panic.
**Gounod** (*gōo-nō'*), **Charles François** (1818–93), Fr. composer of sacred and dramatic music; chief works, 2381; 'Faust', 1228, 2584.
**Gouraud** (*gōo-rō'*), **Henri Joseph Eugène** (born 1867), Fr. general in the World War; commanded Fourth Army 1915–16, 1917 to end of war; in 1919 made high commissioner in Syria and commander-in-chief in the Levant; enters Strasbourg, 104.
**Gourd family** of plants, the *Cucurbitaceae,* 1492; cucumber, 939; melons, 2196; pumpkin, 2934; squash, 3333.
**Gourds,** plants related to melon and squash, 1492.
**Gourmont** (*gōor-môn'*), **Rémy de** (1858–1915). Fr. critic and poet, second only to Anatole France as an authority on contemporary Fr. literature; defender of naturalism of Huysmans and symbolism of Mallarmé; wrote several volumes of "symbolist" poetry.
**Government:** anarchism, 3269; arbitration, 172–3; Bolshevists, 450–1; cabinet system, 555; census, 676–8; citizenship, 768, 2405; civil service, 774, 776; colonies, 837; consular service, 872; courts, 909–10, 1906; diplomatic service, 1012–3; education, 1084, 1086, 3138–42; fire department, 1257–62; elections, 1107–8, 320–1, 2915; family and tribal systems, 1223–4; feudal system, 1235–6; Habeas Corpus, 1557; health department, 1612–5; immigration, 1738; impeachment, 1740–1; initiative, referendum, and recall, 1778–9; international law, 1794; irrigation and reclamation, 1827–30; jury, 1903–5; law, 1972; municipal, 2370; pensions, 2722; police, 2865–8; political parties, 2869–71; poor-laws, 2878–9; postal systems, 2892–8; prisons and punishments, 2918–20; public utilities, 2932–3; socialist theory, 3268–9; suffrage, 3384–5, 3778–9; tariff, 3437–8; taxation, 3440–2; U.S., 3592–3601 (*see also in Index* **United States Government**); veto, 3636. *See also in Index* chief topics above and *Study Outline,* 3990-3.
**"Government of the people, by the people, for the people," 2014.**
**Government ownership,** in Australia, 264–5, 269; of natural resources, 870; of public utilities, 2932–3; of railroads, 2971; and socialism, 3268.
**Government Printing Office,** U.S., 3601.
**Governor,** of states in U.S., duties, 3346.
**Governor,** of steam engine, 3352; principle, 682.
**Governor-General,** in Canada, 620.
**Governor's Island,** fortified isl. in New York harbor, headquarters of an army corps area; about 125 acres; 2488.
**Gower, John** (1325?–1400). Eng. poet, called by Chaucer "moral Gower" and by Lowell "undertaker of the fair medieval legend"; chief work, 'Confessio Amantis', includes many moral stories for purpose of warning a lover against the vices of that day.
**Gowrie, John Ruthven,** 3d **Earl of** (1577?–1600). Scotch nobleman killed, with his brother Alexander, in apparent attempt to assassinate King James VI of Scotland; some evidence that "Gowrie's Conspiracy" may have been a story contrived to hide the king's fault in a personal quarrel which led to violence.
**Gowrie, William,** first **Earl of** (1541?–84), Scotch nobleman; concerned in murder of Rizzio in

1566; custodian of Mary, Queen of Scots, at Lochleven; captured James VI of Scotland, **1860.** Executed for treason by order of James.

**Goya** (*gō'yȧ*) **y Lucientes, Francisco** (1746–1828). Span. portrait painter and etcher of war scenes and bull-fighting; greatest Span. artist between Velasquez and Fortuny; his work is bold but unexaggerated and lifelike.

**Goyen, Jan Josephszoon van** (1596–1656). Dutch landscape painter, depicts typical landscapes with naturalistic truth unmixed with sentiment; cool tints in the skies and scanty detail in buildings and foliage are characteristic of his mature years.

**Gozo** (*gŏt'sō*) or **Gozzo,** Brit. isl. in Mediterranean 3 mi. n.w. of Malta; 26 sq. mi.; pop. 22,000; Victoria chief town; **2131.**

**Gozzi** (*gŏt'sē*), **Carlo** (1722–1806). Ital. dramatist; wrote plays, satirical plays founded on fairy tales, and tragedies with a comic element; 'Re Turandote' is the best known.

**Grabau, Mary Antin.** *See in Index* **Antin, Mary.**

**Graben** (*grä'bĕn*), street in Vienna, **3641.**

**Gracchus, Gaius Sempronius** (153–121 B.C.), Rom. popular leader, son of Cornelia and brother of Tiberius Gracchus; as tribune of the people 123–121 B.C. carried out his brother's judicial and social reforms; **3046. 2878.**

**Gracchus, Tiberius Sempronius** (163–133 B.C.), Rom. tribune in 133 B.C. proposed agrarian laws and other reforms for relief of poor; murdered in riot caused by his attempt to secure reëlection as tribune; **3046.**

**Grace, days of.** *See in Index* **Days of grace.**

**Graces,** in Gk. myth., three daughters of Hera and Zeus: Euphrosyne (joyfulness), Aglaia (brightness), and Thalia (bloom), goddesses of grace and charm; and Aphrodite, **155.**

**Grackle, purple,** or crow bird, **432–3.**

**Gradation,** in physiography, **2788.**

**Grady, Henry W.** (1851–89), Amer. journalist and orator, b. Athens, Ga.; editor of the Atlanta *Constitution* and a leader of the reconstructed South, **1434.**

**Graeae** (*grē'ē*), in Gk. myth., "the gray ones," three sisters, Dino, Enyo, and Pephredas, daughters of Ceto and Phorcys, gray-haired from birth; tell Perseus where to find Gorgons, **2731.**

**Grafting,** of fruit trees, **1377,** *pictures,* **1379;** to save Fr. vineyards, **1501.**

**Graham, George Perry** (born 1859), Canadian journalist and statesman; in House of Commons after 1907 (minister of railways and canals 1907–11; minister of militia and defense 1921).

**Graham, James, Viscount Dundee,** Scotch soldier. *See in Index* **Claverhouse.**

**Graham, Sylvester** (1794–1851), Amer. reformer, b. Suffield, Conn., advocate of temperance, vegetarianism, and unbolted (graham) bread, **1303.**

**Graham, Thomas** (1805–69). Scotch chemist, originated term "colloids," and discovered "Graham's law" that diffusion rate of gases is inversely as square root of their densities.

**Graham flour, 1303.**

**Graham's Land,** tract of land in the Antarctic discovered by John Biscoe, captain of an Eng. sealing ship, in 1831, **1223.**

**Graham's Town.** City in Cape of Good Hope, S. Africa, 80 mi. n.e. of Port Elizabeth; white pop. 8000; ships ostrich feathers; Rhodes Univ. College, St. Andrews College.

**Grahamstown,** New Zealand. Same as **Thames.**

**Grail, Holy,** cup used by Christ at Last Supper; Arthurian legends, **223, 224;** quest of, **1391, 3069.**

**Grain.** *See in Index* **Cereal crops.**

**Grain,** unit of measure, **3715, 3714.**

**Grain elevators,** warehouses for storing grain, **1492, 527, 3731–2,** *picture,* **604.**

**Grain exchanges, 440.**

**Grains of paradise,** or Meleguetta pepper, a spice, **3317.**

**Grain weevil, 3713.**

**Gram,** basic metric unit of weight, **2206.**

**Gramineae** (*grȧ-mĭn'ē-ē*), the grass family of plants, **1503, 3939.**

**Grammar, 1492–5;** adjective, **25;** adverb, **26;** conjunction, **862;** distinguished from rhetoric, **3004;** noun, **2537;** preposition, **2912–3, 1494;** pronoun, **2921–2;** punctuation, **2934–6;** sentence, **3174–5, 1492–3;** verb, **3627–8.**

**Gramophone,** or phonograph, **2774–6;** dictaphone, **1010;** records made of "condensite," **816.**

**Grampian Mts.** or **Hills,** principal mountain mass in Scotland, really a series of spurs; 150 mi. long; rugged on n. side but good pasture land on s.; **3146,** *map,* **1152,** *pictures,* **3147, 3694.**

**Grampus** (from Ital. "large fish"), or blackfish, an inoffensive genus of the dolphin family, **3723.** Name is also applied to the killer whale and to a genus of porpoises.

**Granada** (*grä-nä'dä*), one of chief cities of Nicaragua; pop. 20,133; univ.; cacao-growing dist.; **2505.**

**Granada,** a former Moorish kingdom in s. Spain; about 11,000 sq. mi.; divided into three modern provinces, of which Granada (4928 sq. mi.; pop. 545,000) is one; history, **3304, 2323;** irrigation introduced, **3302.**

**Granada,** Spain, onee cap. of Moorish kingdom, now cap. of province of the same name, 120 mi. n.e. of Gibraltar; pop. 82,820; cathedral; univ.; Alhambra, **97, 3302,** *picture,* **3298;** street dancers, *picture,* **3299;** surrendered to Ferdinand, *picture,* **3301.**

**Granby,** Quebec. Town on Yamaska R. about 55 mi. s.e. of Montreal; pop. 7000, chiefly French; rubber goods, tobacco, carriages, furniture, foundry products.

**Gran Canaria** (*grän kä-nä'rī-ä*). One of Canary Isls., 74 mi. n.w. of Africa; 644 sq. mi.; pop. 162,601; healthful climate; 60,000 to 70,000 tourists each year; fishing and vineyards.

**Gran Chaco.** *See in Index* **Chaco, El Gran.**

**Grand Alliance,** league of European powers, **85, 1196;** and Monroe Doctrine, **2307.**

**Grand Army of the Republic,** a patriotic society organized at Decatur, Ill. (1866), **2695.**

**Grand Bank.** *See in Index* **Newfoundland Banks.**

**Grand Canal,** China, **625, 230, 745;** commerce, **2708, 1574.**

**Grand Canal,** Venice, **3623,** *pictures,* **3624, 517.**

**Grand Canyon,** of Colorado R., in n. Ariz., **1495–7; 200;** first visited by Europeans, **892;** *maps,* **201;** *picture,* **2402.**

**Grande Chartreuse** (*shär-trûz'*), celebrated monastery in France, **2299.**

**Grand Falls,** of the Hamilton R., Labrador, **1948.**

**Grandfather clause,** provision included in constitution of several southern states which excuses from other suffrage tests those who have served in any war and their descendants and those who were voters before Jan. 1, 1867, and their descendants; adopted as means of restricting suffrage to white voters; **3385, 73.**

**"Grandfather's clock,"** a weight-and-pendulum timepiece, **797–8,** *picture,* **801.**

**Grand Forks,** N.D., 2d city in state, on e. boundary on Red R.; pop. 14,010; distributing point for lumber, wheat, live stock; state univ., **2525,** *picture,* **2523.**

**Grand Haven,** Mich. Port and summer resort on L. Michigan at mouth of Grand R. 25 mi. w. of Grand Rapids; pop. 7205; fishing, fruit, and celery interests; various mfrs.

**Grand Island,** Neb., mfg. and commercial city 85 mi. w. of Lincoln; pop. 13,947; Grand Island College; **2432.**

**Grand Island College.** At Grand Island, Neb.; co-ed., Bapt.; opened 1892; liberal arts, commerce, music.

**Grandison, Sir Charles,** hero of Richardson's novel of that name; self-conscious prig, designed to represent ideal English gentleman; **2540.**

**Grand Junction,** Colo. Agricultural center at junction of Grand and Gunnison rivers, near Utah border; pop. 8665.

**Grand jury, 1904;** instituted in England, **1633.**

**Grand Lake.** Largest lake of Newfoundland; length 56 mi.; 192 sq. mi.

**Grand Mere** (*grän mêr*), Quebec. Lumber-mfg. town on St. Maurice R., about 25 mi. n. of Three Rivers; pop. 8000; pulp, paper, furniture, rubber goods.

**"Grand Monarch, The," 2065,** *picture,* **2066.**

**"Grand Old Man," 1468.**

**Grand opera.** *See in Index* **Opera.**

**Grand piano, 2801,** *pictures,* **2799–2800.**

**Grand Pré,** Nova Scotia, historic village about 45 mi. n.w. of Halifax, near Minas Basin, in farming and fruit-growing dist.; pop. 400; famous as scene of Longfellow's 'Evangeline', **2538, 4,** *picture,* **2538;** statue of Evangeline, *picture,* **617;** Borden's birthplace, **466.**

**Grand Rapids,** Mich., "furniture capital of U.S."; pop. 137,634; **1497, 2224.**

**Grand Remonstrance.** Protest against misgovernment presented to Charles I (1641) by Eng. House of Commons; the king's impeachment of and attempt to arrest the 5 leaders responsible for the Remonstrance were causes of the Civil War.

**Grand Rhone River, 3012.**

**Grand River,** Labrador. Same as **Hamilton River.**

**Grand River,** rises in n. Colo., flows s.w. 350 mi. joining Green R. in s.e. Utah to form Colorado R.; deep canyons, *maps,* **840, 3610.**

**Grand River,** S.D., rises in n.w.; flows e. to Missouri R.; *map,* **3296.**

**Grand Teton Mt.,** Wyo., 30 mi. s. of Yellowstone National Park, **3036.**

**Grand Trunk Pacific Railroad, 608.**

**Grangers,** or "Patrons of Husbandry," a secret society in interests of farmers, **879, 2871.**

**Grania** (*grā'nī-ȧ*) or **Grainne** (*grān*). In Celt myth. the Helen of the Fenian cycle of old Irish tales, beautiful young betrothed of the old Finn; deserts him for Dermot.

but finally weds him when Dermot is dead.
**Granicus** (*grā-nī'kŭs*). Anc. name of small r. in n.w. Asia Minor where Alexander the Great won first victory over Persians, 334 B.C.
**Granite, 1497;** quarrying, **2943–5;** Me., **2128;** N.H., **2454,** *picture,* **2455;** Vt., **3633,** *pictures,* **3632, 2944;** Wis., **3771.**
**Granite City,** Ill. Mfg. city near Mississippi R., just n. of St. Louis, Mo.; pop. 14,757; iron and steel, coke, chemicals, graniteware, corn products.
**Granite Hills,** Vt., **3632.**
**Granite Peak.** A summit of Rocky Mts., highest point in Montana (12,834 ft.).
**Granite State, 2453.**
**Graniteware, 1148.**
**Granny knot, 1938–9.**
**Gran Quivira,** (*grän kē-vē'rä*), ruins in N.M., **2467.**
**Granson, battle of** (1476), **697.**
**Grant, Frederick Dent** (1850–1912). Amer. general; accompanied father, Gen. U. S. Grant, in many Civil War campaigns; graduated West Point 1871 but resigned from army 1881; colonel of volunteers 1898, served in Cuba and Philippines, successively promoted until major-general in regular army.
**Grant, George Monro** (1835–1902). Canadian clergyman and educator, known for his eloquence on political platform scarcely less than in pulpit; for 25 years principal of Queen's Univ. which he made one of leading Canadian institutions.
**Grant, Robert** (born 1852). Amer. judge and author, b. Boston ('Unleavened Bread'; 'The Chippendales'; 'Convictions of a Grandfather').
**Grant, Ulysses S.** (1822–85), 18th president of U.S., **1498–9;** tomb, **1499,** *picture,* **2493.** —*In Civil War,* **1498–9, 779, 1984;** at Chattanooga, **700–1;** and Sheridan, **3204;** and Sherman, **3205;** at Shiloh, **3206–7, 3205;** at Vicksburg, **3637.** —*Administrations,* **1499;** panics (1869 and 1873), **3606;** reconstruction measures, **780;** *Alabama* claims arbitrated, **73;** Custer massacre, **1773, 2312;** Hayes-Tilden election dispute, **1610–1.**
**Grant Land,** n.w. part of Ellesmere Land, large isl. w. of Greenland, **189,** *map,* **2514–5.**
**Grao** (*grä'ō*), **El,** harbor of Valencia, Spain, **3615.**
**Grape aphid** or **phylloxe'ra,** a bug which attacks grapevines, **1501, 154.**
**Grapefruit,** a citrus fruit, **1499–1500;** vitamins, **3652.**
**Grapes, 1501–2;** attacked by moth larvae, **548;** Calif., **582;** as commercial crop, **2588;** currants, **940;** flowers, **3535;** grape mildew, **2236;** N.Y., **2486;** Ohio, **2571;** Portugal, **2888;** raisins, **2974;** yield tartaric acid, **3438, 10.**
**Grape-shot,** an old type of artillery projectile, **636.**
**Grape sugar,** or dextrose, the commonest of the glucose sugars, **3388, 1475.**
**Graphite** (*grăf'īt*), a soft, black form of crystalline carbon, **1502, 935;** Ala., **70;** as "lead" in pencils, **2712–4;** Brazil, **494;** Ceylon, **685;** used in electrotyping, **1125.**
**Graph'ophone,** or phonograph, **2774–6;** dictaphone, **1010;** records made of "condensite," **816.**
**Grapple dredges,** type of excavating machine, **1040–1.**
**Grapple plant,** S. African herb; seed, *picture,* **2830.**
**Gras'mere,** England, a village in Westmorland, near lake of same name; famous as a haven for poets and authors; home of Wordsworth, **3788.**
**Grasse** (*grȧs*), **François J. P., Comte de** (1722–88), Fr. admiral, commanded Fr. fleet in operations before Yorktown in Amer. Rev., **3004.**
**Grasse,** France, 18 mi. w. of Nice; winter resort; marble quarries; makes oil and conserves; perfume industry, **2728.**
**Grasses,** various plants, not otherwise named, of the grass family, **1502–3;** harbor wheat rust spores, *picture,* **3100.**
**Grass family,** or *Gramineae,* a large family of monocotyledenous plants, **1503, 3939;** distinguished from sedges, **3171;** includes bamboo, **323–4;** barley, **330–1;** corn, **891;** hay-yielding types, **1609;** millet, **2239;** oats, **2548–9;** rice, **3013–5;** rye, **3102;** sorghum, **3276;** sugar cane, **3386;** wheat, **3732.**
**Grasshopper, 1503–6, 1788,** *picture,* **2408;** attracted by white, **2410;** distinguished from locusts, **1506, 2045;** egg, *picture,* **1091;** eye, *picture,* **1215;** has no larval stage, **1786;** leg, *picture,* **2229.**
**Grasshopper mouse, 2359.**
**Grasshopper sparrow, 3308.**
**Grassi** (*grȧs'sē*), **Battista** (born 1855), an Ital. zoölogist, studied especially life and habits of white ants and eels; mosquito, **2653, 2335.**
**Grass rugs, 3080.**
**Grass snake,** one of the garter snakes, so called because it lives in the grass; eggs, *picture,* **1091.**
**Gratiano** (*grä-shi-ä'nō*), character in Shakespeare's 'Merchant of Venice', **2199.**
**Grattan** (*grăt'ăn*), **Henry** (1746–1820). Irish patriot, orator, and statesman; opposed parliamentary union of Ireland with Gt. Brit., but accepted accomplished fact; in Brit. Parliament 1805 till death; strove for Catholic emancipation; conspicuous for probity of his character no less than for his ability.
**Grätz** (*grêts*) or **Graz,** 2d city of Austria, 140 mi. s.w. of Vienna; pop. 156,000; iron and steel mfrs.; univ. and technical schools; interesting buildings of Middle Ages; **269.**
**Gravelines** (*grä-vē-lēn'*), France. Fortified seaport on Ar R., 10 mi. s.w. of Dunkirk; fisheries, shipping, shipbuilding; here Span. troops under Egmont defeated French under Marshal Thermes.
**Gravelines** (*grä-vē-lēn'*), France. village 7 mi. w. of Metz; defeat (Aug. 18, 1870) of French under Bazaine by Prussians under Crown Prince Frederick (also called battle of Rezonville) led to investment of Metz; *picture,* **1352.**
**Graver,** an engraving tool, **1168.**
**Graves, Robert** (born 1895), Eng. poet, **1168.**
**Gravesend** (*grāvz'ĕnd*), England. Market town and river port on Thames R. 22 mi. s.e. of London; pop. 28,000; favorite resort for Londoners.
**Gravita'tion, 1506–9;** affects earth's internal structure, **1064;** causes tides, **3496–8;** controls comets, **852;** deflects light (Einstein theory), **2000–1,** *picture,* **1999;** how measured, **2715, 1064;** on moon, **2322, 1506, 1508,** *pictures,* **1508, 2320;** Newton's theory, **2476–8;** strength on different planets, **1903, 2816, 2817, 3394;** determines speed of falling bodies, **2190.**
**Gravity, center of, 1509.**
**Gravity, specific, 1509.**
**Gravity yard,** railroad, **2970–1.**
**Gray,** a color, **837.**
**Gray, Asa** (1810–88), Amer. botanist, b. Paris, N.Y.; coöperated with Darwin, **964;** professor of natural history, Harvard Univ.; prolific writer on botany and allied subjects.
**Gray, Elisha** (1835–1901), Amer. electrician; perfected various telegraphic devices; invented telautograph; telephone, **3458, 379.**
**Gray, Robert** (1755–1806), Amer. navigator, sent out by Boston merchants to trade for furs with Indians on Pacific Coast; named Columbia R. for his ship; **2596.**
**Gray, Stephen** (1696–1736), Eng. electrician discovered electric properties of many substances, **1117.**
**Gray, Thomas** (1716–71), Eng. poet, rebel against classicism; great student and possessed vast knowledge of classical authors, painting, architecture, and botany; his greatest poem, 'Elegy in a Country Churchyard', made him one of the immortals of Eng. literature; **1166.**
**Gray-back whale,** a baleen, **3724.**
**Gray Friars.** Same as **Franciscans.**
**Graylag,** a wild goose, **1488.**
**Grayling,** a salmon trout, **3545.**
**Grays Harbor,** an inlet of the Pacific, indenting w. coast of Washington for a distance of 15 mi., *map,* **3687.**
**Graz,** Austria. Same as **Grätz.**
**"Greaser," 2507.**
**Great American Desert, 3580, 3584.**
**Great ant-eater, 145–6.**
**Great auk,** extinct bird, **258.**
**Great Australian Bight, 262,** *map,* **264–5.**
**Great Barrier Reef,** off n.e. coast of Australia, longest coral reef in world (1200 mi.), **262, 886,** *map,* **264–5,** *picture,* **885.**
**Great Basin,** region in w. U.S., about 200,000 sq. mi., between Sierra Nevada on w. and Wasatch Mts. on e.; streams have no outlet to sea; **3580, 3231, 2444;** caused by geologic "fault," **1064;** rainfall, **3588.**
**Great Bear** or **Ursa Major,** a constellation; *chart,* **873;** Gk. legend, **872.**
**Great Bear Lake,** in n.w. Canada; 11,200 sq. mi.; **2102.**
**Great Belt,** Denmark, strait separating isls. of Fünen and Zealand, **321, 996,** *map,* **997.**
**Great Bible, 389.**
**Great bird of paradise,** color plate facing **2676.**
**Great blue heron,** *picture,* **413.**
**Great Britain,** isl. separated from w. Europe by English Channel; 88,210 sq. mi.; pop. 43,000,000; comprises England, Scotland, Wales; **1509–10,** *maps,* **1159, 1196–7;** army, **218, 3575;** army and navy decorations, **978–9,** *pictures,* **977;** elevation, *map,* **1190–1;** emigration to U.S., **1738, 2718,** *figure,* **3581;** flag, **1287;** learned societies, **4;** marine corps, **2149;** national song, **2404;** navy, **2423, 2424;** orders of knighthood, **979;** population, *map,* **1190–1;** rainfall, **1510,** *map,* **1190–1;** shipping, **3219;** vegetation, *map,* **1190–1.** *See also in Index* **British Empire; England; England, history of; Scotland, Wales.**
**Great Charter.** Same as **Magna Carta.**
**Great circle sailing, 2422.**
**"Great Commoner," 700.**
**Great Council,** in England, **2687.**
**Great Dane,** dog, **1021.**
**Great Divide.** Same as **Continental Divide.**
**Great Dividing Range,** Australia, **261, 262,** *maps,* **264–5.**
**Great Dog.** Same as **Canis major.**
**'Great Eastern',** ship, *picture,* **3208;** used in cable laying, **561,** *pictures,* **557.**
**"Great Elector."** *See in Index* **Frederick William.**
**Great emerald paradise bird, 2674.**
**Greater Antilles, 3718.**

**Greater New York,** 2498.
**Great Falls,** Mont., mfg. and shipping center on Missouri R., 70 mi. n.e. of Helena, in farming and stock-grazing region; pop. 24,121; great smelting works; immense water-power; **2312.**
**Great Falls of the Missouri, 2273, 1989.**
**Great Falls of the Potomac, 2902.**
**Greatheart.** In Bunyan's 'Pilgrim's Progress', guide of Christiana and her children to the Celestial City.
**Great Ice Barrier,** in Antarctic region, **145, 2863.**
**Great Island,** site of Queenstown, Ireland, **2950.**
**Great Kanawha River.** *See in Index* **Kanawha.**
**Great Lakes,** the 5 lakes (Superior, Michigan, Huron, Erie, and Ontario) lying on the borders of Canada and the U.S.; total area nearly 100,000 sq. mi.; **1510–4** *maps,* **1511, 3584–5;** canals, **1513, 1514, 627, 3129–30, 3716;** commerce, **1511–2, 1513, 2720, 1000, 1820, 1826;** distinctive ships, **3218,** *pictures,* **1512, 2257, 811;** effect on climate, **1510, 2224, 2582, 3751;** fisheries, **1512, 1283, 3770–1;** history, **1514, 1964;** Ice Age, **2516, 1721.** *See also* individual lakes by name.
**Great Meadows,** Pa. Site 50 mi. s.e. from Ft. Duquesne (now Pittsburgh) where Washington fought first battle (1754), defeating French.
**Great Mogul,** a famous diamond, **1004,** *picture,* **1005.**
**Great Northern Railroad, 2963.**
**Great organ,** manual of an organ, **2600.**
**"Great Paul,"** bell, **379.**
**Great Plains,** region in cent. U.S., **3581, 3588, 3884–5,** *maps,* **2514–5.**
**Great Primer type, 3572.**
**Great Pyramid, 2939, 2940, 1100, 568,** *pictures,* **1094, 570.**
**Great Rebellion,** in England (1642–49). *See in Index* **Civil War** (England).
**'Great Republic',** famous clipper ship, **3210.**
**Great Russia,** historic division of Russian Empire, **3084.**
**Great Russians, 3250;** language, **3096.**
**Great Salt Lake,** in n.w. Utah; 80 mi. long; **1515, 3612,** *pictures,* **3116.**
**Great Salt Lake Desert, 3580.**
**Great Schism** (*sizm*), division in Rom. Cath. church (1378–1417) between two factions, each of which supported its own pope, **3607, 1705.**
**Great Serpent Mound,** Adams County, Ohio, **2357.**
**Great Slave Lake.** *See in Index* **Slave Lake.**
**Great Smoky, Smoky,** or **Unaka Mts.,** a range of the Appalachians on border of N.C. and Tenn., **158, 3465, 2518.**
**Great Southern Ocean.** *See in Index* **Antarctic Ocean.**
**Great Stone Face,** rock formation in N.H., **2453, 1609.**
**"Great Tom,"** bell, **379.**
**Great Trek, 3280.**
**Great Valley,** of Calif., **576, 578, 581.**
**Great Wall of China, 744–5,** *map,* **740,** *picture,* **741.**
**Great War.** Same as **World War.**
**'Great Western',** early steamship, **3210. 510.**
**"Great White Way," 2491,** *picture,* **2493.**
**Greaves,** armor, **214,** *picture,* **215.**
**Grebes,** diving birds, **1515;** foot, *picture,* **409;** pied-billed, *picture,* **413;** nest, *picture,* **407.**
**Greece, ancient, 1517–26,** *maps,* **27, 1518;** armor, *picture,* **215;** astronomy, **239, 872, 1064, 2942;** athletics, **251, 2580–1;** chief cities, **251, 886, 3308–10, 3485–6;** coins, **2282;** commerce, **1520, 1522, 3524, 886;** dolls, **1026;** dress, **897, 1598,** *picture,* **898;** food, **1518, 708, 2579, 3385;** govt., **1520–2, 3274–5, 3308, 3309;** how houses were heated, **3368;** influence on modern civilization, **1536;** lamps, **1958;** life and customs, **1520, 1522, 1523, 3308–9;** mathematics, **1422, 2942;** medicine, **2193;** ships of war, **3207;** slavery, **3248–9, 1522, 3309;** sundials and water-clocks, **797;** zoölogy, **3841;** writing, **455.**
*Religion and mythology,* **2385, 872, 525;** drama, **1536, 1031–2;** games and festivals, **156, 993, 1031–2, 2580–1;** oracle of Delphi, **991;** origin of chief gods, **3607.** For detailed references to chief Gk. myths *see* Study Outline, **3981-4.**
*History,* **1518–26;** chief events summarized, **1655–7;** geographic influences, **1517–8;** Aegean civilization, **27–9;** Gk. invasions, **1518, 1520, 29;** Homeric Age, **1520, 3542–4** (*see also in Index* **Homer, stories from**); rise of city-states, **1520–1;** Persian Wars, **2738–40, 2143–4, 3113, 3487, 195;** founding of colonies, **1520, 837, 3230;** Athenian Empire, **1522, 251, 2729–30, 195;** Peloponnesian Wars (459–446 B.C.), **1524–5;** supremacy of Sparta, **1525, 3309–10;** Theban leadership, **3485–6, 1525;** Macedonian rule, **1525, 85–6, 993;** Hellenistic Age, **1525, 87–8;** Roman conquests, **1525, 3046, 886;** Gothic invasion, **73.**
**Greece, modern,** kingdom in s.e. Europe; 57,400 sq. mi. (claims in Asia Minor, 12,000 sq. mi.); pop. 6,300,000; **1526–8,** *maps,* **308, 1196–7;** army uniform, **897;** cap, Athens, **249–51;** Corinth, **886;** education, **251;** govt., **1526;** national song, **2405;** religion, **1528;** Saloniki, **3114–5.** —*History,* **1526;** Balkan Wars (1912–13), **310. 1526, 2097;** union with Crete, **918–9;** influence of Venizelos, **3625–6;** World War and peace settlement, **3789–3812, 2097.**
**Greek art, 1529–32;** enameling, **1145;** music, **2376;** influence of Pericles, **2729;** painting, **2628, 1529;** Phidias, **2759–60, 1530;** sculpture, **1529–32.** —*Architecture,* **177, 178;** houses, **1524;** remains at Athens, **250–1, 11–12;** three orders, **177, 886,** *picture,* **180.** For a list of the many famous examples of Gk. art reproduced in this work *see* Study Outline, **4012.**
**Greek Empire.** Same as **Byzantine Empire.**
**Greek fire, 1552.**
**Greek language, 1534–5;** alphabet, **101, 2774;** belongs to Indo-European group, **2771;** dialects, **1538;** influence on English, **1162;** modern, **1534, 1538;** New Testament in, **390;** relation to Latin, **1965–6.**
**Greek letter societies, 828.**
**Greek literature, 1534–8;** Aesop's fables, **30–1;** drama, **1536–7, 1031–3, 1038, 3482, 3484;** Hellenistic Age, **1538, 88;** historians, **1537, 1645, 2840, 3823;** Homeric epics, **1535, 1675–6, 3542** (*see also in Index* **Homer**); influence on Latin, **1966;** influence on Renaissance, **2995–6;** novels, **1538, 2539;** oratory and philosophy, **1537–8, 993, 2832, 3004–5.**
**Greek Orthodox church, 1528, 2994, 3250.**
**Greek philosophy, 2773, 1537–8, 1249;** Aristotle, **195–6;** Diogenes, **1011–2;** Epictetus, **1173;** Plato, **2832;** Pythagoras, **2941–2;** Socrates, **3270–1.**
**Greeley, Horace** (1811–72), Amer. journalist and politician, **1538–9. 1499, 968.**
**Greeley,** Colo., trade center of irrigated region, on Cache la Poudre R., 50 mi. n.e. of Denver; pop. 10,958; flour, canned goods, beet sugar; settled in 1870 by "Greeley Colony," group of New Englanders named for Horace Greeley; Teachers' College, **845.**
**Greely, Adolphus Washington** (born 1844), Amer. Arctic explorer, b. Newburyport, Mass.; commanded expedition to Lady Franklin Bay (1881), **2860.**
**Green, Anna Katherine** (Mrs. Charles Rohlfs) (born 1846). Amer. novelist; writes detective stories showing good plot and knowledge of criminal law ('Leavenworth Case'; 'A Strange Disappearance'; 'The Golden Slipper').
**Green, Hetty** (1835–1916). Amer. financier, b. New Bedford, Mass.; noted for shrewdness and parsimoniousness; believed to be richest woman of her day in U.S.
**Green, John Richard** (1837–83). Eng. historian ('Short History of the English People', brilliant picture of social progress).
**Green, Thomas Hill** (1836–82). Eng. philosopher; chief Eng. representative of so-called Neo-Hegelian school of philosophy; maintained the existence of a timeless intelligence as the essential principal of all knowing beings; though never popular, wielded wide influence over other philosphers.
**Green,** a secondary color, **837, 2642;** place in spectrum, *diagram,* **3311.**
**Greenaway, Kate** (1846–1901). Eng. artist, famous for quaint drawings of children, characterized by skilful coloring and humorous touches.
**Greenback-Labor party,** U.S., **1611.** It nominated presidential ticket in 1880, but by 1884 had practically disappeared.
**Greenback party,** U.S., **1611, 2871.**
**Greenbacks,** U.S. notes so called because back was printed in green, **2282, 2871.**
**Green Bay,** an arm of L. Michigan, 120 mi. long, navigable for largest lake steamers; *maps,* **3770, 2226;** Marquette on, **2151;** Nicolet, **3768.**
**Green Bay,** Wis., port at mouth of Fox R. and at head of Green Bay, 108 mi. n. of Milwaukee; pop. 31,017; large trade in coal, lumber, fish, and grain; makes lumber, canned goods, paper, flour, furniture; **3772, 3770.**
**Greenbrier White Sulphur Springs,** W.Va., **3720, 3331.**
**Green bugs,** or aphids, the so called "plant lice," **154.**
**Greencastle,** Ind. City 40 mi. w. of Indianapolis; pop. 3800; De Pauw Univ.; lumber products, flour, cement.
**Greene, Nathanael** (1742–86), Amer. Rev. general, **1539, 3004;** quoted, **534.**
**Greene, Robert** (1560?–92), Eng. dramatist and poet, remembered for a few charming lyrics and a derisive reference to Shakespeare in his 'Groatsworth of Wit Bought with a Million of Repentance'; **3190.**
**Greeneville,** Tenn., in n.e. corner, on Southern R.; pop. 3775; home of Andrew Johnson, **1896.**
**Greenfield,** Mass. Mfg. town on Connecticut R., 33 mi. n. of Springfield; pop. 15,462; machinery, cutlery, paper, brick.
**Green fly,** a bright green flesh-fly, *pieture,* **1789.**
**Green gage plum, 2840.**
**Greenland,** isl. n.e. of America; almost wholly within Arctic Circle; estimated area, 512,000 to 825,000 sq. mi.; pop. 14,000; Danish pos-

session; **1539–40,** *maps,* **2514–5, 1540, 189;** Eskimos, **1174–7;** Hudson explores coasts, **1690;** ice-cap, **1465;** Northmen settle, **2526;** Peary's explorations, **2704.**
**Greenland seal, 3166.**
**Greenlet,** a vireo, **3647.**
**Green monkey, 2291.**
**"Green Mountain Boys," 3630, 98.**
**Green Mts.,** range of Appalachian system extending through Vt.; highest peak, Mt. Mansfield (4364 ft.); **3632, 3633, 158.**
**Green Mountain State, 3630.**
**Greenock** (*grēn'ŏk*). Scotland, seaport 20 mi. n.w. of Glasgow; pop. 80,000; shipbuilding, sugar refining; **3147, 3704.**
**Greenough** (*grēn'ō*), **Horatio** (1805–52). Amer. sculptor, b. Boston; designed Bunker Hill Monument and colossal statue of Washington now in national Capitol.
**Green River,** in Ky., 350 mi. long; joins the Ohio R. s.e. of Evansville, Ind., **2573,** *map,* **1917.**
**Green River,** rises in Wyo.; unites with Grand in s.e. Utah to form the Colorado; 750 mi. long; **845, 3582,** *maps,* **3820, 840, 3610.**
**Greensand.** A clay or sand colored green by glauconite.
**Greensand marl,** a marl containing greensand; used as fertilizer; N.J. deposits, **2460.**
**Greensboro,** N.C. Cotton mfg. city 70 mi. n.w. of Raleigh; pop. 19,861; trade in tobacco, cotton, iron, and coal; named for Nathanael Greene.
**Greensburg,** Pa. Center of a coal-mining, coking, and natural gas region, 26 mi. s.e. of Pittsburgh; pop. 15,033; iron, steel, and glass products, chinaware.
**Green tea, 3450.**
**Green turtle, 3563.**
**Greenville,** Miss. Cotton-trading and mfg. center; pop. 11,560; 95 mi. n.w. of Jackson on Mississippi R.
**Greenville,** Ohio. City in w. 34 mi. n.w. of Dayton; pop. 7104; scene of Gen. Anthony Wayne's Treaty of Greenville with Indian tribes.
**Greenville,** S.C., important textile mfg. city and cotton market in extreme n.w.; pop. 23,127; several colleges and schools; **3292.**
**Greenville,** Tex. Trade center 50 mi. n.e. of Dallas; pop. 12,384; cotton-growing and stock-raising section.
**Green vitriol, 3390.**
**Greenwich** (*grĕn'ĭch*), Conn. Summer resort and suburb 28 mi. n.e. of New York City on Long Island Sound; pop. 22,123; founded by Dutch in 1648 as part of province of N.Y.; scene of Rev. War battle.
**Greenwich** (*grĭn'ĭj*), England, borough of London on Thames R.; pop. 100,000; naval hospital and college; famous Royal Observatory on prime meridian; **2056, 1968.**
**Greenwich time, 3500.**
**Greenwich Village,** New York City, **2494.**
**Greenwood, Sir Hamar** (born 1870). Brit. statesman; under-sec. of state for Home Affairs 1919; chief sec. for Ireland 1920.
**Greet, Ben.** Eng. actor and manager; presents Shakespeare's plays as they were done in Elizabethan times.
**Gregg, John Robert** (born 1867). Amer. educator and author, b. Ireland, emigrated to U.S. (1893); founder of Gregg system of shorthand and author of textbooks connected with system.
**Gregg shorthand, 3224–5.**
**Grego'rian calendar, 574.**
**Gregorian chant, 2377, 1541, 2814.**
**Gregory,** popes. For complete list *see in Index* **Pope.**
**Greg'ory I, the Great** (540?–604), pope, **1540–1;** sends Augustine to England, **636;** church music, **2377.**
**Gregory VI** (d. 1047), pope, **1541.**
**Gregory VII,** Hildebrand (1020–85), pope, **1541;** investiture conflict, **1632–3, 1447.**
**Gregory IX** (d. 1241), pope, **1541.**
**Gregory XI** (d. 1378), pope, **1541.**
**Gregory XII** (1325?–1417), pope, **1541.**
**Gregory XIII** (1502–85), pope, **1541, 574.**
**Gregory, Lady Augusta,** Irish dramatist and romance writer, associated with Yeats in Irish literary revival ('Gods and Fighting Men'; 'Irish Folk History Plays'), **1814.**
**Gregory, the Illuminator, Saint** (257?–332), reputed founder and patron saint of Armenian church, **212.**
**Gregory of Nazian'zus, Saint** (329–389). Churchman whose writings contain best statement of doctrine of Trinity in Gk. orthodox theology; a graceful and powerful expounder but not an original thinker.
**Gregory of Nys'sa, Saint** (331?–386). Gk. churchman who anticipated doctrine of transubstantiation; a constructive thinker.
**Gregory, Thomas Watt** (born 1861). Atty.-gen. of U.S. 1914–19.
**Grenada** (*grĕ-nā'dȧ*), southernmost of Windward Isls., Brit. W. Indies, 90 mi. n. of Venezuela; 133 sq. mi.; pop. 67,000; cap. St. George; cocoa, nutmegs, spices, fruit, and cattle; health resort; *map,* **2514–5.**
**Grenade** (*grĕ-nād'*), an explosive missile, usually thrown by hand; used in World War, **3791;** makeshift type, **631.**
**Grenadines** (*grĕn-ȧ-dēnz'*). Group of about 600 small isls. in Brit. W. Indies stretching for 60 mi. between Grenada and St. Vincent.
**Grenfell, Wilfred Thomason** (born 1866), Brit. medical missionary in Labrador, **1541–2.**
**Grenoble** (*grĕ-nō'bl*), France. Fortified city on Isère R. 60 mi. s.e. of Lyons; pop. 78,000; univ.; kid gloves.
**Gren'ville, George** (1712–70). Eng. statesman; prime minister 1763; secured passage of Amer. Stamp Act, one of causes of Amer. Rev.; noted for eloquence, public spirit, and business ability.
**Grenville, Sir Richard** (1541?–91). Eng. naval hero; commanded fleet carrying colonists to Roanoke Isl. in 1585; killed when his ship *Revenge* tried to cut way through Span. fleet (read Tennyson's 'Revenge').
**Grenville, William Wyndham, Baron** (1759–1834). Eng. statesman, son of George Grenville; as premier (1807) secured abolition of Eng. slave trade; advocated Cath. emancipation.
**Gresh'am, Sir Thomas** (1519–79). Eng. merchant and financial agent of the govt.; founder of Royal Exchange and Gresham's College; formulator of "Gresham's law."
**Gresham, Walter Quinton** (1833–95). Amer. jurist and statesman; maj.-gen. in Civil War; sec. of treasury 1884; sec. of state 1893; served as federal judge and postmaster-general, in which post he barred all lotteries from mails.
**Gresham's law, 2282.**
**Gretchen,** heroine in Faust legends, **1228.**
**Gret'na Green.** Village of Dumfriesshire in s.w. Scotland near Eng. border; formerly scene of runaway marriages from England.
**Greuze** (*grûz*), **Jean Baptiste** (1725–1805). Fr. genre and portrait painter, whose work in painting, like Rousseau's in literature, represents a sentimental return to nature ('The Broken Pitcher', 'Innocence').
**Greville, Charles C. F.** (1794–1865). Eng. public official and diarist whose journals (published 1875–87) contain much valuable historical material for first half of the 19th cent.
**Grévy** (*grā-vē'*), **Jules** (1807–91). Fr. statesman, prcs. of Fr. Assembly 1871–76, pres. of Chamber of Deputies 1876–79; pres. of Fr. Republic 1879–87; resigned owing to scandals involving his son-in-law in traffic in offices and decorations.
**Grey, Albert Henry George,** 4th **Earl** (1851–1917). Gov.-gen. of Canada 1904–11; stimulated social and economic progress.
**Grey, Charles,** 2d **Earl** (1764–1845), Eng. statesman; premier 1830–34; forces passage of Parliamentary Reform Bill, **2869, 3083.**
**Grey of Fallodon, Edward Grey,** first **Viscount** (born 1862). Eng. Liberal statesman, foreign sec. 1905–16, most conspicuous figure in European politics during that decade; with Edward VII arranged Triple Entente; in 1914 worked vainly to prevent World War; signally successful in maintaining friendly relations with neutrals during early years of the war; raised to peerage 1916; sent as temporary ambassador to U.S. 1919.
**Grey, Lady Jane** (1537–54), "nine-days' queen" of England, **1542, 1089.**
**Grey, Zane** (born 1875), Amer. novelist; 'Desert Gold'; 'Riders of the Purple Sage', 'Desert of Wheat', 'Man of the Forest', and other tales of adventure in the West; quoted, **2462.**
**'Greyfriars Bobby, The Story of', 1024–5.**
**Greyhound, 1021, 1023,** *pictures,* **1022.**
**Greylock, Mt.,** highest peak in Mass., **2164.**
**Greymouth** (*grā'mŭth*), New Zealand. Seaport and gold-mining, coal, and lumber center on w. coast of South Isl. at mouth of Grey R.; pop. 5500.
**Greytown** or **San Juan del Norte.** Principal seaport on Atlantic coast of Nicaragua; exports bananas, coconuts, mahogany.
**Griboedov** (*grē-bō-yĕd'ŏf*), **Alexander** (1795–1829). Rus. dramatic poet and statesman; sent to Persia as minister, where he was killed by a mob; famous for one comedy, 'Misfortune from Intelligence', a satirical drama showing Rus. manners and social struggle between older and younger generation.
**Grieg** (*grēg*), **Edvard Hagerup** (1843–1907), Norwegian composer, **1542.**
**Griffin, Walter Burley** (born 1876), Amer. architect, planner of Australian capital, **628.**
**Griffin.** A mythical creature, half eagle, half lion, supposed to guard hidden treasure.
**'Griffin',** La Salle's ship, **1964.**
**Griffith, Arthur** (1872–1922). Irish statesman; organizer of Sinn Fein; became pres. of Dail Eireann succeeding De Valera 1922 on negotiation of peace with Gt. Brit.
**Griffith, Sir Samuel Walker** (1845–1920). Australian conservative lawyer and statesman; chief justice of Australia 1903–20.
**Grillparzer** (*grĭl'pär-tsĕr*), **Franz** (1791–1872), greatest Austrian dramatic poet; chief works, **1438.**
**Grilse,** an immature salmon, **3113.**

**Grimal'di, Joseph** (1779–1837). Famous Eng. clown; Charles Dickens edited his 'Memoirs'.
**Grimaldi,** name given to supposed prehistoric race of man represented by skeletons found in grotto near Mentone, **2133.**
**Grimm, Jacob** (1785–1863), Ger. scholar, founder with his brother Wilhelm (1786–1859) of science of folk-lore, **1318;** pioneer in philology, **2771.**
**Grims'by** or **Great Grimsby.** Seaport on n.c. coast of England, near mouth of Humber R.; pop. 82,000; immense fishing trade, shipbuilding works.
**Grinding teeth,** or molars, **3452.**
**Grindstones, 3123, 1142;** largest factory, **3787.**
**"Gringo"** (*grĭng'gō*), nickname for Americans, **2507.**
**Grinnell', Henry** (1799–1874). Amer. ship-owner, b. New Bedford, Mass.; financed Franklin relief expeditions (1850 and 1853–55) and later Arctic explorations; Grinnell Land is named for him.
**Grinnell,** Iowa. City 45 mi. n.e. of Des Moines; pop. 5362; Grinnell College.
**Grinnell College.** At Grinnell, Iowa; co-ed.; established 1846 (opened 1848); arts and sciences, engineering, music.
**Grinnell Land.** Part of Ellesmere Isl.; discovered 1850 by Grinnell expedition.
**Griqualand** (*grē'kwä-lănd*), **East.** A native territory of Cape of Good Hope Province; 6602 sq. mi.; pop. 250,000.
**Grisel'da,** heroine of romance, famed for her patience; Chaucer's story retold, **706–7.**
**Grisi** (*grē'sē*), **Giulia** (1811–69). Ital. dramatic soprano, greatest of her day.
**Gris-Nez** (*grē-nā'*) ("gray nose"), **Cape.** Headland of France, point of Fr. coast nearest to that of Britain.
**Gri'son,** a weasel, **752.**
**Grisons** (*grē-zôn'*), easternmost and largest canton of Switzerland; 2773 sq. mi.; pop. 120,000; noted for superb Alpine scenery, especially in the Engadine, **3417;** language, **3415.**
**Gristle.** Same as **Cartilage.**
**Grits,** hulled grain; hominy, **890.**
**Grizzly bear, 350,** *picture,* **355.**
**Grizzly Giant,** famous big tree, **3176.**
**Groat.** A medieval Eng. silver coin, value fourpence.
**Grodno** (*grōd'nō*) or **Gardinas.** City in s. Lithuania, on Niemen R.; pop. 62,000; interesting old buildings; taken by Germans in World War; varied mfrs.; trade in grain and timber.
**Groin,** in architecture, **180,** *picture,* **187.**
**Groningen** (*grō'nĭng-ĕn*). Seaport and chief city of n. Holland; pop. 89,000; numerous canals; large trade, various mfrs., shipbuilding; univ.
**Gros** (*grō*), **Antoine Jean, Baron** (1771–1835). Fr. painter of military pictures, chiefly Napoleonic; pupil of Louis David.
**Grosbeak,** various stout-beaked birds of the finch family, **1542–3, 1241,** *pictures,* **418;** cardinal, **642–3,** *picture,* **1241.**
**Groseillers** (*grō-sā-yêr'*), **M. C., Sieur de** (1621–84?), intrepid Fr. explorer and fur trader, brother-in-law of his companion Radisson; explorations, **617, 3772, 2257.**
**Gross tonnage, 3220.**
**Grosswardein** (*grōs-vär'dīn*). Same as **Nagy-Varad.**
**Gros Ventres** (*grō vänt'r*), Fr. name for Hidatsa or Minitari tribe of Plains Indians; formerly lived along Missouri R. in N.D.; **1767.**
**Grote, George** (1749–1871). Eng. historian and banker; his 'History of Greece' is "one of the few great comprehensive histories."
**Grotius** (*grō'shĭ-ŭs*), **Hugo** (1583–1645), Dutch statesman and jurist, "father of modern science of international law," **1794;** tomb, **2441.**
**Groton** (*grō'tŏn*), Conn. Town on Thames R. opposite New London; pop. 4236; site of Ft. Griswold, where Tories under Benedict Arnold massacred Americans 1871.
**Grouchy** (*grų-shē'*), **Emanuel, Marquis de** (1766–1847), Fr. marshal, to whose delay at Waterloo Napoleon's defeat is attributed, **3699.**
**Ground-beetles, 369, 371,** *picture,* **367.**
**Ground hemlock** or American yew, **3830.**
**Groundhog** or woodchuck, **1543.**
**Groundhog Day, 1543.**
**Ground holly** or wintergreen, **3752.**
**Ground ivy, 1854.**
**Ground laurel** or trailing arbutus, **173.**
**Groundnut,** name for peanut, **2700, 859, 1751.**
**Ground shark, 3196.**
**Ground squirrels,** several species of ground-living squirrels, **3333–4, 2912;** include chipmunk, **752,** groundhog or woodchuck, **1543,** prairie dog, **2912.**
**Ground-water, 3331, 222.**
**Grouper, Nassau,** a fish of the sea-bass family, *pictures,* **2925.**
**Grouse, 1543–5;** courtship drumming, **405,** *picture,* **406;** protective coloration, **2924.**
**Growth,** affected by glands in animals, **1469–70;** cell division, **672;** enzymes may be factor, **1173;** marked by "rings" in trees, **3532;** rapid in bamboos, **323.**
**Grubs, 1964.**
**Grubstreet,** defined by Dr. Johnson, **1898.**
**Gru-gru nut,** edible fruit of the gru-gru palm, **2546.**
**Grundy, Mrs.** The personification of society's judgments; name originated in old play 'Speed the Plough', where a character asks continually, "What will Mrs. Grundy say?"
**Grunt.** A name given to the redmouth or ronco, a food-fish of warm Amer. seas, because of the peculiar grunting or drumming noise it makes.
**Gruyère** (*grū-yêr'*), Switzerland, picturesque town perched on a high hill 16 mi. s. of Fribourg; pop. 2000; famous for its cheeses; **3416.**
**Gruyère cheese, 709.**
**Guadalajara** (*gwä-thä-lä-hä'rä*). Second city of Mexico, and cap. of Jalisco; pop. 120,000; 275 mi. n.w. of Mexico City; center of Mex. steel and glass industries; Indian pottery; silver mining and farming region; severe earthquakes 1875 and 1912; city founded 1531.
**Guadalaviar** (*gwä-thä-lä-vē-är'*) (Arabic "white river"), a river in Spain, 150 mi. long; its waters irrigate fertile plain around Valencia and give city most of its water supply; **3615.**
**Guadalquivir** (*gwä-thäl-kē-vēr'*) (Arabic "great river"), river in Spain, 350 mi. long; rises in e. of province of Jaen; flows s.w. through Seville and Cordova into Atlantic, 20 mi. n. of Cadiz; **3181, 3182,** *map,* **3300.**
**Guadalupe** (*gą-dą-lọp'*), inhabited isl. in Pacific Ocean, 75 mi. off coast of Lower Calif.; rises from an oceanic abyss; 15 mi. long; sea elephants, **3169.**
**Guadalupe-Hidal'go,** Mexico, town 3 mi. n. of Mexico City, where treaty was signed 1848 ending Mexican War; treaty terms, **2208.**
**Guadalupe Peak.** Highest point in Texas (9000 ft.), in Guadalupe Range lying between Rio Grande and Pecos rivers, in Texas and New Mexico.
**Guadalupe River,** Tex., rises in s.w.-cent. part and flows s.e. to point about 20 mi. from Gulf of Mexico, where it divides, one branch uniting with San Antonio R., and other emptying directly into San Antonio Bay, **3476.**
**Guadeloupe** (*gą-dē-lọp'*), Fr. possession in W. Indies; 688 sq. mi.; pop. 215,000; **1545.**
**Guadiana** (*gwä-thē-ä'nä*), one of the longest (520 mi.) of the five great Span. rivers, but narrow and poor in volume; flows into Gulf of Cadiz; *map,* **3300.**
**Gualiaca** (*gwä-lē-ä'kä*), village in Peru, *picture,* **2742.**
**Guam** (*gwäm*), South Sea isl. owned by U.S.; 225 sq. mi.; pop. 14,000; **1545;** cable, **561;** ceded to U.S., **2104, 3307;** Magellan discovers, **2116;** strategic importance, **2625.**
**Guan.** A turkey-like bird of Cent and S. Amer., belonging to the same family as the curassow; it has dark green or black plumage, a long graceful tail, and a throat almost bare and usually with a pendent wattle; one species, called the "chacalaca" from its harsh loud cry, ranges n. through Texas.
**Guanabacoa** (*gwä-nä-bä-kō'ä*). **Town** in Cuba, 6 mi. e. of Havana; pop. 14,367; summer resort; medicinal springs.
**Guanaco** (*gwä-nä'kō*), wild S. Amer. ruminant of the camel family, **2039.**
**Guanajuato** (*gwä-nä-hwä'tō*), state in cent. Mexico; 10,950 sq. mi.; pop. 1,086,000; cap. Guanajuato; minerals, **2210.**
**Guanajuato** or **Santa Fe de Guanajuato,** Mexico, historic city 165 mi. n.w. of Mexico City; pop. 36,000; gold and silver mining; first battle in Mex. war of independence fought here in 1810; *picture,* **2213.**
**Guanchos** (*gwän'chōz*), Hamitic people, natives of Canary Isls., originally tall, blond, athletic, but later mixture with Arabs changed these characteristics; by language allied to anc. Numidians; **628, 3608.**
**Guano** (*gwä'nō*), a fertilizer, **1235;** penguin deposits, **2716;** yields phosphorus, **2777.**
**Guantanamo** (*gwän-tä'nä-mō*), Cuba Town on Guaso R. near head of fine harbor on s. coast; pop. 69,000.
**Guantanamo Bay,** Cuba, **936,** *map,* **938.**
**Guarani** (*gwä-rä'nē*), native Indians of Paraguay, **2677.** Their descendants also form bulk of population of Uruguay, and are important element in Bolivia and Brazil.
**Guardafui** (*gwär-dä-fwē'*), **Cape.** Extreme eastern point of Africa; promontory of Somaliland at entrance to Gulf of Aden.
**Guarini** (*gwä-rē'nē*), **Giambattista** (1537–1612). Ital. poet; wrote **'Il** Pastor Fido'; like Tasso's 'Aminta' on which it is patterned, it is a lyric conception of the ideal life; identifies happiness with simple rustic life; 'Il Pastor Fido' and 'Aminta' are the finest pastoral poems in Ital. literature.
**Guarneri** (*gwär-nä'rē*), **Guarnie'ri,** or **Guarne'rius,** celebrated family of Ital. violin-makers, 17th and 18th cents., of whom most celebrated was Giuseppe Antonio (1687–1745): **3646.**
**Guatemala** (*gwä-tä-mä'lä*), republic of Cent. Amer.; 48,290 sq. mi.; pop.

2,000,000; **1545–6, 679–82,** *maps,* **2514–5, 680;** Yucatan, **3834–5.**

**Guatemala City,** cap. of Guatemala, r.r. and commercial center; pop. 90,000; 50 mi. from Pacific coast; makes textiles, earthenware; **1546;** earthquake of 1917, **1066, 680.**

**Guava** (*gwä'vȧ*), a small fruit grown in tropics, **1378.**

**Guaviare** (*gwä-vē-ä'rā*) **River,** Venezuela; rises in Andes, flows e. 700 mi.; little economic value; **2600.**

**Guayaquil** (*gwī-ä-kēl'*), only seaport of Ecuador, S. Amer., on Gulf of Guayaquil; pop. 105,000; large foreign trade; shipyards; **1078,** *picture,* **1079.**

**Guayaquil, Gulf of,** large inlet of Pacific in Ecuador; over 100 mi. wide at its mouth; narrows into estuary of Guayas R.; **1078.**

**Guaymas** (*gwī'mäs*),- seaport of Mexico on Gulf of California; r.r. connections with U.S.; **2209.**

**Guayule** (*gwä-yų'lā*) **shrub,** of the family *Compositae;* yields rubber, **3073, 3074, 2212.**

**Gudbrandsdal** (*gų'bräns-däl*), cent. valley of Norway, **2532.**

**Gudenof, Boris.** *See in Index* **Boris Gudenof.**

**Gudrun** (*gų̈d'rų̈n*). A Low German epic saga, taking the place of the Nibelungenlied in High German; Gudrun, the heroine, is kidnapped by an admirer, but after being held prisoner for 14 years is rescued by her brother and Herwig, her true lover.

**Guelf** (*gwĕlf*), **House of,** Hanoverian rulers of England, **1428.**

**Guelfs and Ghibellines,** political factions of medieval Germany and Italy, **1546;** Dante, **958;** in Florence, **1293;** Otto IV, **2606.**

**Guelph,** Ontario. City about 45 mi. w. of Toronto on Speed R.; pop. 18,500; Ontario Agricultural College and Macdonald Institute; annual stock show; foundry products, rubber goods, sewing machines, agricultural implements, linen.

**Guemal** (*gwā'mal*), S. Amer. deer, distinguished from other deer by antlers which have only a single forking and by tusks in upper jaw of both sexes, **981.**

**Guenevere.** *See in Index* **Guinevere.**

**Guenon** (*gē-nôn'*), an African monkey; species commonly used by organ-grinders and as pets; **2291.**

**Guericke** (*gā'rĭk-ē*), **Otto von** (1602–86), Ger. physicist, *picture,* **1117;** built early water barometer, **333;** invented air pump, electrostatic machine, and the "Magdeburg hemispheres," **1117.**

**Guérin** (*gā-răn'*), **George Maurice de** (1810–39). Fr. poet and prose writer; wrote 'The Centaur', prose poem of strange mystic beauty; all his work characterized by passion for nature; 'Reliquiae', his collected poems.

**Guérin, Jules** (born 1866). Amer. painter and illustrator, b. St. Louis, Mo.; landscape and architecture in flat decorative effects similar to Japanese; had charge decorations San Francisco Exposition 1914; painted decorations for Lincoln Memorial, Washington, D.C., and Pennsylvania R.R. station, New York City.

**Guernsey** (*gērn'zi*), 2d in size of Channel Isls.; 19 sq. mi.; pop. 44,997; St. Peter Port and St. Sampson chief towns; **687;** Victor Hugo, **1694.**

**Guernsey cow, 950,** *picture,* **49.**

**Guerrero** (*gĕ-rā'rō*), Mexico. State in s. on Pacific; 25,279 sq. mi.; pop. 621,000; cap. Chilpancingo; agricultural and undeveloped mineral resources.

**'Guerrière'** (*gêr-yêr'*), Brit. frigate in War of 1812, **3672, 2423.**

**Guiana** (*gē-ä'nȧ*), a region in n.e. of S. Amer. comprising Brit. Guiana (90,000 sq. mi.; pop. 310,000), Dutch Guiana (46,000 sq. mi.; pop. 110,000), and Fr. Guiana (32,000 sq. mi.; pop. 30,000), **1546–7,** *maps,* **1547, 3288–9;** boundary dispute with Venezuela, **3622–3;** Raleigh's expedition to, **2975.**

**Guiana highlands,** a division of Venezuela, **3620.**

**Guidi, Tommaso.** *See in Index* **Masaccio.**

**Guido** (*gwē'dō*) **of Arezzo** or **Aretinus** (995?–1050?), Benedictine monk; introduced modern system of music notation, **2377.**

**Guido Reni** (*rā'nē*) (1575–1642), Bolognese painter, great master in a school beginning to decline into sentimental insipidity; 'Aurora and the Hours', *picture,* **259.**

**Guienne** (*gē-ĕn'*), anc. Aquitania, former province of s.w. France; cap. Bordeaux; *map,* **1351;** acquired by Eng. crown, **1633;** Hundred Years' War, **1699, 1700.**

**Guilbert** (*gēl-bêr'*), **Yvette** (born 1869). A Parisian singer unsurpassed in her day for dramatic and humorous rendition of old ballads.

**Guildhall.** Old council hall in Cheapside, London, several times rebuilt; fine statues; 2 giant wooden figures of Gog and Magog.

**Guilds.** Same as **Gilds.**

**Guilford Court House,** N.C., site of battle March 1781, between Green and Cornwallis, 5 mi. n.w. of Greensboro; now public park; **3004.**

**Guillaume** (*gē-yōm'*), **Charles Edouard** (born 1860). Fr. physicist, inventor of invar; 1920 Nobel prize winner in physics.

**Guillemot** (*gĭl'ĕ-mŏt*), a bird of the auk family; egg, *picture,* **1091.**

**Guillotine** (*gĭl'ō-tēn*), Fr. instrument of execution, **1368, 2919.**

**Guimaraes** (*gē-mä-rĭush'*), Portugal. Picturesque town 35 mi. n.e. of Oporto; birthplace of first king of Portugal.

**Guinea** (*gĭn'ē*), term loosely applied to w. coast region of equatorial Africa, from Senegal R. to Orange R.; former slave trade, **33, 2434.**

**Guinea,** A former Eng. gold coin so named because gold of which it was coined originally came from Guinea Coast; term still used as money unit (21 shillings, about $5).

**Guinea, Gulf of,** the part of the Atlantic between Cape Palmas and Cape Lopez on w. coast of Africa, *map,* **40–1.**

**Guinea-fowl, 1547–8.**

**Guinea-pig,** or cavy, **1548;** care as pet, **2757;** inheritance of colors, **1642.**

**Guinevere** (*gwĭn'ĕ-vēr*), in Arthurian romance, Arthur's beautiful unfaithful queen, **223, 3068, 3069, 3070.**

**Guiney** (*gī'nĭ*), **Louise Imogen** (d. 1921). Amer. poet, b. Boston ('The White Sail and Other Poems').

**Guiscard, Robert.** *See in Index* **Robert Guiscard.**

**Guise** (*gēz*). Fr. ducal family, branch of house of Lorraine, whose heads led extreme Catholic party and aspired to snatch crown from house of Bourbon.

**Guise, Henry, Duke of** (1550–88), "le Balafré" (the Scarred); incited murder of Coligny and Massacre of St. Bartholomew; assassinated by order of Henry III of France; **826, 1696.**

**Guise, Mary of.** *See in Index* **Mary of Guise.**

**Guise,** France. Fortified town on Oise R., 90 mi. n.e. of Paris; taken by Germans 1914.

**Guitar** (*gĭ-tär'*), a stringed musical instrument, **1548,** *picture,* **2382.**

**Guiteau** (*gē'tō*), **Charles** (1840–82), Amer. lawyer, assassin of Pres. Garfield, **1399.**

**Guitry** (*gē'trē'*), **Lucien Germain** (born 1860). Fr. actor, considered the greatest Fr. interpreter of modern realistic drama; his son Sacha (born 1885) also became distinguished as an actor and writer of clever comedies.

**Guizot** (*gē-zō'*), **François** (1787–1874), Fr. statesman and historian; head of ministry under Louis Philippe ('History of Civilization in Europe'); **2067.**

**Gujrat** (*gų̈j-rät'*). Cap. of dist. of Gujrat in n. India; British defeated Sikhs in 1849.

**Gules** (*gūlz*), in heraldry, **1639.**

**Gulf Coastal Plain,** lowlands in s. part of U.S. bordering on Gulf of Mexico; originally old sea bottom, by elevation made dry land; **3581, 72, 3474, 3881–2.**

**Gulf of Mexico,** arm of the Atlantic, almost enclosed by U.S., Mexico, and Cuba; 700,000 sq. mi.; **1548–9;** anc. extent, **2068, 2266.**

**Gulfs,** how they originated, **2788.**

**Gulf Stream,** a warm-water current flowing from the Gulf of Mexico across the Atlantic to northern Europe, **1549, 255;** how formed, **2558;** meets Labrador current, **2450;** nearest approach to U.S. coast, **2513;** touches Norway, **2530.**

**Gulfweed,** a sea-weed with air-bladder floats, **3170, 3700.**

**Gulick, Luther Halsey** (1865–1918), Amer. physical culture specialist; founds Camp Fire Girls, **594.**

**Gull,** a long-winged fish-eating bird, **1549–51, 412,** *pictures,* **413, 2709.**

**Gullet** or **esophagus,** muscular tube from mouth to stomach, **3360, 1011.**

**'Gulliver's Travels',** satire by Swift, **3406;** story retold, **3407–10.**

**Gum arabic,** soft gum obtained from acacias, **1552, 4;** antidote for phosphorus, **2855;** Sudan production, **1093;** used in candy-making, **630, 1552.**

**Gumbo** or **okra, 1397.**

**Gums,** substances obtained by drying various tree saps, **1552;** camphor, **594;** copal, **1552, 3619;** chewing, **719;** distinguished from resins, **1552, 2997;** kauri, **2499;** mesquite yields two kinds, **2201;** in perfumes, **2728;** sweet gum tree, **3533;** spruce, **3332;** tragacanth, **1552, 1042;** in varnish, **3619, 2643.**

**Gum tree** or **eucalyptus, 1186–7.**

**Gun** (weapon). *See in Index* **Cannon; Firearms.**

**"Gun,"** for spraying liquid, **2847.**

**Guncotton,** an explosive made by treating cotton with nitric and sulphuric acids, **673, 1211–2.**

**Gundohl,** hero of Javanese legend, **1877.**

**Gunga Din.** In Rudyard Kipling's poem, faithful Hindu water-carrier, who dies succoring his master. "Though I've belted you and flayed you . . . you're a better man than I am, Gunga Din!"

**Gun-metal leather, 1977.**

**Gun'nison tunnel,** Colo., **3552.**

**Gun'ny,** coarse cloth used as sacking; made of hemp, **1630;** jute, **1905–6.**

**Gunpowder, 1552–3, 712;** explosive force, **1211;** effect on feudal system, **1935, 773.**

**Gunpowder Plot,** Eng. conspiracy (1605), **1228, 1860.**

**Gunpowder tea,** *picture,* **3446.**

**Gunter, Edmund** (1581–1626). Eng. mathematician; invented "chain" for land measurement.

**Gunter chain,** used in surveying, **3398.**

**Gunther** (*gų̈n'tĕr*), in 'Nibelungenlied', king of Burgundians, **2504, 3231.**

**Gurkhas** (*gu̯r'kȧs*), dominant race of Nepal, **1744.**

**Gur'nards,** medium-sized fish with bony-plated heads and several detached fin-rays used as feelers; certain types are called "sea robins" from the grunting noise they make when taken from the water; *pictures,* facing **2553, 1273.**

**Gusher,** a spouting oil well, **2752, 2753,** *pictures,* **2751, 2749.**

**Gusta'vus I, Vasa** (1496–1560), king of Sweden, founder of Vasa dynasty; made king 1523 by Swedish peasants on expulsion of Danes; established Protestant Reformation in Sweden, **3404.**

**Gustavus II, Adolphus** (1594–1632), king of Sweden, **1553–4, 3488;** aided by Richelieu, **3018;** originates modern army, **218.**

**Gustavus V** (born 1858), king of Sweden, **3405.**

**Gustavus Adolphus College.** At St. Peter, Minn.; co-ed.; Lutheran; founded 1862.

**Gutenberg** (*gu̯'tĕn-bĕrĸ*), **Johannes** (1400?–68), Ger. inventor of printing from movable types, **2916, 2019;** printing press, *picture,* **2917.**

**Guthrie** (*gu̯th'rĭ*), Okla. City 30 mi. n. of Oklahoma City, on Cimarron R.; pop. 11,757; market for farm products of surrounding country.

**Guthrum** (*gu̯th'rŭm*) (d. 890), Danish chief, king of E. Anglia; defeated by Alfred, **90.**

**Gutiérrez** (*gu̯-tē-ā'rĕth*), **Antonio Garcia** (1813–84), Span. dramatist of romantic school, **3307.**

**Gutta-percha,** gummy substance resembling rubber, **1554, 1552;** use in cables, **556, 557.**

**Gutzkow** (*gu̯ts'kō*), **Karl Ferdinand** (1811–78). Ger. dramatist and novelist; a leader in "Young Germany" school, revolting against literary, social, and religious traditions ('Uriel Acosta'; 'Die Ritter vom Geiste').

**Guy'andotte River,** rises in southern W.Va. and flows n.w. 150 mi. to Ohio R., **3720,** *map,* **3722.**

**Guy Fawkes Day** (Nov. 5), **1228.**

**Guynemer** (*gu̯ĕn-mār'*), **Georges** (1894–1917). Fr. aviator, perhaps most brilliant "ace" of World War; brought down more than 50 enemy machines before he was killed.

**Guyot, Mt.** Peak of Great Smoky Mts. on N. Carolina-Tennessee border (6636 ft.)

**Gwalior** (*gu̯ŏ'lĭ-ŏr*). Citadel and anc. city of cent. India; pop. (with modern Lashkar, cap. of native state of Gwalior) 71,000; beautiful palace and Hindu temples.

**Gwyn, Nell** (1650–87). English actress, favorite of Charles II; her wit, generosity, and kindness endeared her to the English public.

**Gyges** (*ġī'ġēz*). In Gk. myth., hundred-handed giant flung into Tartarus for making war on the gods.

**Gyges,** king of Lydia (7th cent. B.C.). Possessor, according to legend, of magic ring that made the wearer invisible; with its aid he killed the reigning king and usurped his throne.

**Gymna'sium,** Ger. school, **3140.**

**Gymnas'tics,** **2784.** *See also in Index* **Athletics.**

**Gymnosperms** (*ġĭm'nō-spērmz*), flowering plants whose immature seeds are not protected by a seed-containing structure, **2831, 3938;** trees, **3533.**

**Györ** (*dyĕr*), Hungary. Same as **Raab.**

**Gypsies.** *See in Index* **Gipsies.**

**Gypsum** (*ġĭp'sŭm*), a soft mineral, usually white, **1554–5, 571;** crystal, *picture,* **935;** from New Mexican "white sand," **3123;** relative hardness, **2248;** used in paints, **2642.**

**Gypsy moth,** a moth of the silkworm family, **1328, 548;** furry caterpillar, *picture,* **368.**

**Gyrocompass, 1555.**

**Gyroscope** (*ġī'rō-skōp*), **1555–6.**

# H

HAVEN'T you often wondered why so many uneducated English people are constantly leaving off "h's" and putting them where they don't belong? As when the cook says, "I'll 'eat it first, ma'am, and then you can heat it." You may be interested to learn that even the ancients dropped their "h's," and that the modern sound of the letter is a weakened form of the older and stronger Phoenician *Cheth*, which was pronounced about like Scotch or German *ch*. This Phoenician letter consisted of two uprights connected by two or three transverse bars  and its name meant "fence." It was derived from the Egyptian hieroglyph representing a sieve  which developed into the form  and finally was transformed into the angular ladder-like character. The early Greeks wrote it  and later, omitting the cross bars at top and bottom, gave it the form of our H. Its sound also ceased to be a harsh guttural and became an aspirate or breathing sound like our *h*. Soon, however, the eastern Greeks lost the aspirate and, having no further use for the symbol with this value, adopted it to represent the long *e*-sound (like our *a*), calling it *Eta* instead of *Heta*, as formerly. The western Greeks, however, retained the aspirate for a longer time, and the Romans took it over from them. The Roman *h* was, however, a very weak sound and in vulgar Latin soon disappeared. This explains why the *h*-sound is virtually non-existent in French, Italian, and Spanish, which are derived from the Latin. Perhaps one reason why the Englishman has so much trouble with his "h's" is that during the period when the English language was taking shape, it was the rule to pronounce the letter in words derived from the Anglo-Saxon and to treat it as silent in words of Latin origin. This naturally caused great confusion. In a few English words of Latin origin, as *heir*, *hour*, *honor*, *h* is still, as in French, written but not pronounced.

**Haakon** (*hô'kŏn*) **IV** (1204–63), "the Old," king of Norway; added Greenland and Iceland to Norwegian realm; invades Scotland, **3489.**

**Haakon VII** (born 1872), king of Norway; accepted Norwegian crown, 1905, on separation of Norway from Sweden, **2536, 757;** marries sister of George V, **1089.**

**Haarlem** (*här'lĕm*), Netherlands, cap. of N. Holland; attractive city 10 mi. w. of Amsterdam; pop. 78,000; cathedral; various mfrs.; large flower industry, **2441;** costume, *picture*, **2439;** Hals' paintings, **1567.**

**Haarlem Lake,** Holland, former shallow lake, 46,000 acres, now agricultural commune; reclaimed, **1827.**

**Habakkuk** (*hă-băk'ŭk*), a Hebrew minor prophet probably of 7th cent. B.C.; Book of Habakkuk, 8th of the minor prophets, deals with the wickedness of the nation, the rise of the Chaldeans, and the appearance of God in judgment, **2923.**

**Habeas corpus** (*hā'bē-ăs kôr'pŭs*), a writ requiring a person in custody to be brought before a court, **1557.**

**Habichtsburg,** "Hawk's Castle," seat of Hapsburgs, **1576, 1578.**

**Habit, 1557;** studied in psychology, **2930.**

**Habitant** (*ă-bē-tăn'*), name given to Fr.-Canadian peasant, **1042, 2948.**

**Habsburg.** Same as **Hapsburg.**

**Hacien'da, 736.**

**Hackbut,** early hand-gun, **1252.**

**Hack'ensack,** N.J. City 12 mi. n. of Jersey City on Hackensack R.; pop. 17,667; silks, clothing, wall paper, school supplies.

**Hack'ett, James Keteltas** (born 1869). Amer. actor and manager ('The Prisoner of Zenda'; 'The Pride of Jennico'); son of James H. Hackett (1800–71), who was one of the most noted comedians of his day.

**Hack'matack,** a larch tree, **1963.**

**Haddock,** a cod-like fish, **1558, 1278.**

**Had'don Hall.** Famous old mansion in Derbyshire, England, 30 mi. s.e. of Manchester; associated with Dorothy Vernon.

**Ha'den, Sir Francis Seymour** (1818–1910), Eng. etcher and surgeon; in addition to distinguished career as surgeon, became foremost Eng. etcher, causing revival of etching in England; brother-in-law of Whistler; **1170.**

**Hades** (*hā'dēz*), in Gk. myth., god of underworld, or the underworld itself, **1558, 3607;** and Persephone, **991–3;** visited by Hercules, **1640.**

**Hadji.** Same as **Hajji.**

**Hadley, Arthur Twining** (born 1856). Amer. educator and political economist, b. New Haven, Conn.; president Yale Univ. 1899–1921.

**Hadramaut** (*hä-drä-mout'*), a region of s. Arabia; boundaries undefined; *map*, **232–3.**

**Hadrian** (*hā'drĭ-ăn*), **Publius Aelius** (76–138), Rom. emperor, **3048, 3303;** Adrianople named for, **26;** arch in Athens, **249;** builds wall in Britain, **1152, 1160;** bust, *picture*, **3043;** mausoleum (Castle Sant' Angelo), **3057,** *picture*, **3051;** rebuilds Jerusalem, **1886.**

**Hadrian,** popes. For list *see in Index* **Pope.**

**Hadrian's Wall,** Rom. fortification across n. England between the Tyne and Solway Firth, **1152, 1160, 3048.**

**Haeckel** (*hĕk'ĕl*), **Ernst Heinrich** (1834–1919). Ger. biologist; advocated Darwinian views; aroused controversy by anti-theological attitude ('Natural History of Creation'; 'The Riddle of the Universe').

**Haemon** (*hē'mŏn*), in Gk. myth., son of Creon, **2566.**

**Hafiz** (*hä'fĭz*). Pen name of Shamsed-Din Mohammed (d. 1388?), greatest Persian lyric poet; tomb near Shiraz a celebrated place of pilgrimage.

**Ha'gar.** Sarah's handmaid, mother of Abraham's son Ishmael (Gen. xvi, xxi).

**Hagen** (*hä'gĕn*), in 'Nibelungenlied', slayer of Siegfried. **3231, 2504.**

**Hagenbeck** (*hä'gĕn-bĕk*), **Karl** (1844–1913), Ger. animal dealer and showman, first to train "happy family" groups of lions, tigers, dogs, cats, rabbits, mice, living or performing together; introduced many improvements in methods of caring for and exhibiting animals; zoölogical gardens, **1568.**

**Ha'gerstown,** Md., mfg. city in center of rich farm section, 64 mi. n.w. of Baltimore; pop. 28,064; knit goods, machinery, lumber products, flour; battlefields of Antietam and Gettysburg; **2162;** John Brown, **516.**

**Hagfish,** or borer, an eel-like parasitic fish, **2680.**

**Haggai** (*hăg'ā-ī*), the 37th book of the Old Testament and 10th of the minor prophets. Haggai prophesied about 520 B.C.; appealed to his countrymen to restore the temple.

**Hag'gard, Sir Henry Rider** (born 1856). Eng. novelist and writer on land economics; spent early life in S. Africa, scene of many of his best novels, including 'She', 'King Solomon's Mines', 'Allan Quatermain', and 'Ayesha, or the Return of She', fantastic stories which show a fertile imagination and create an unreal atmosphere.

**Hagiographa** (*hā-ĝĭ-ŏg'rà-fā*), or "Holy Writings," portion of the Old Testament, **2923.**

**Hague** (*hāg*), **The,** cap. of the Netherlands; pop. 350,000; scene of many international conferences; **1558.**

**Hague Peace Conferences, 1559;** and Germany, **1449, 1559;** established Hague Tribunal, **172, 1559;** determine international law, **1794;** Nicholas II, **2506;** Peace Palace, gift of Carnegie, **646,** *picture*, **1558;** U.S. represented, **3606.**

**Hague Tribunal,** a permanent court of international law, composed of not more than four delegates appointed from each state; created at first International Peace Conference (1899), **1559, 172.**

**Hahnemann** (*hä'nĕ-män*), **Samuel C. F.** (1755–1843). Ger. physician, founder of "homeopathy."

**Haifa** (*hī'fà*), Palestine, town 70 mi. n. of Jerusalem at foot of Mt.

Carmel; pop. 10,000; commercial importance, **2645.**

**Haig** (*hāg*), **Sir Douglas,** first **Earl of Bemersyde** (born 1861), Brit. soldier, **1559;** at battle of Somme, **3275.**

**Haiho** (*hā-hō'*), river of China, formed just above Tientsin by the confluence of the Peiho and three other rivers, **3498.**

**Hail, 1559.**

**'Hail Columbia',** patriotic song, **2405.**

**Hainan** (*hī-nän'*) Chinese isl. 10 mi. s. of China in China Sea; 14,000 sq. mi.; pop. 2,000,000; jungle-covered mts.; rich valleys; sugar cane, cotton; *map,* **740.**

**Hainisch** (*hī'nish*), **Michael** (born 1856). Elected president of Austrian Republic 1920; well known Socialist writer; previously (1909) member of Austrian parliament.

**Hair, 1559–60;** alpaca and vicuña, **100, 804, 3782;** camel, **590,** *picture,* **1560;** care of, **1713;** characteristic of mammals, **2132;** in cloth, **804;** contains sulphur, **3389;** fashions in arrangement, **898, 900, 1869,** *pictures,* **35, 2130;** horse, *picture,* **1560;** modified into spines, **2883;** mohair, **1476, 804, 3782;** rabbit, **1584,** *picture,* **1560;** spider, *picture,* **3323.**

**Hair-line micrometer, 2227.**

**Hair-spring,** of clocks and watches, **800, 803.**

**Hairworms, 3814.**

**Hairy** or **woolly rhinoceros,** extinct species, common in Europe during the Ice Age, *picture,* **667.**

**Haitian Straits,** China, **1319.**

**Haiti** (*hā'tī*), negro republic in W. Indies; 10,200 sq. mi.; pop. estimated 2,500,000; **1560–1,** *map,* **2514–5;** coffee, **824, 1561;** discovery, **849;** Las Casas' work for Indians, **1965;** wars with Santo Domingo, **3125;** charges of U.S. misrule, **1582.**

**Hajji** (*hăj'ē*), title gained by pilgrims to Mecca, **2187.**

**Hake.** A large marine fish closely related to the cod, but not popular as food; one species (*Merluccius bilinearis*) is abundant on the New England coast and is caught in the same manner as the cod; usually eaten fresh, occasionally smoked and dried.

**Hakluyt** (*hăk'lụt*), **Richard** (1553–1616). Eng. geographer ('Voyages and Discoveries of the English Nation', called the "prose epic of the modern English nation").

**Hakodate** (*hä-kō-dä'tē*), Japan. Fortified seaport on rocky promontory in s. Hokushu; pop. 100,000; exports fish products, charcoal, sulphur, timber.

**Halcyon** (*hăl'sĭ-ŏn*) or **Alcyone,** in Gk. myth., daughter of Aeolus, **1925.**

**Halcyon,** a kingfisher, **1925.**

**"Halcyon days," 1925.**

**Hal'dane, Richard Burdon Haldane,** first **Viscount** (born 1856). Eng. statesman and philosopher; wrote life of Adam Smith; translated Schopenhauer's 'World as Will and Idea'; sat in House of Commons 1885–1911; as sec. for war 1905–12 created dept. machinery which functioned in World War; lord chancellor 1912–15.

**Hale, Edward Everett** (1822–1909), Amer. preacher, social worker, and writer, author of 'The Man without a Country'. **1561–5.**

**Hale, John Parker** (1806–73). Amer. orator and statesman, long member of House of Representatives and for 16 years of Senate; anti-slavery advocate; nominated for president by Free-Soil Democrats in 1852; consistently supported Lincoln throughout Civil War.

**Hale, Nathan** (1755–76), Amer. Rev. soldier and patriot, **1565.**

**Ha'leb,** Syria. Same as **Aleppo.**

**Halévy** (*ä-lā-vē,*), **J. F. F.** (1799–1862), Fr. (Jewish) composer ('La Juive' and 'L'Clair'); master of fine effects of vocalization and instrumentation.

**Halévy, Ludovic** (1834–1908). Fr. dramatist and novelist ('L'Abbé Constantin', sweetly sentimental, immensely popular tale, classic for Fr. instruction).

**"Half-breeds,"** Republicans who opposed nomination of Grant for 3d term (1880), **1399.**

**Half moon,** a lunar phase, **2318.**

**'Half Moon',** Hudson's ship, **1690,** *picture,* **1691.**

**Half-tones,** how made, **1170,** *pictures,* **1169, 1171, 1172.**

**Hal'iburton, Thomas Chandler** (1796–1865), Canadian humorist; pen name "Sam Slick"; lawyer and judge in Nova Scotia; retired to England (1856); **623.**

**Halibut,** a large flatfish, **1565, 1289–91, 1278.**

**Halicarnassus** (*hăl-ĭ-kär-năs'ŭs*), anc. Gk. city in Caria, Asia Minor; site of famed Mausoleum, **3178,** *pictures,* **1531, 3179;** birthplace of Herodotus, **1645.**

**Hal'idon Hill,** height n.w. of Berwick-upon-Tweed, England, where English under Edward III defeated the Scotch (1333), **3148.**

**Hal'ifax, Charles Montague, Earl of** (1661–1715). Eng. statesman; introduced into Gt. Brit. national debt instead of annual taxation to meet expenses of war; carried out recoinage (1695); patron of Newton, whom he appointed warden of mint.

**Halifax,** England, mfg. city in n., 12 mi. s.w. of Leeds; pop. 106,000; textiles, iron products, chemicals, coal-mining, quarrying; **1160.**

**Halifax,** cap. of Nova Scotia; pop. 60,000; **1565–6;** drying codfish, *picture,* **608;** shipping, **2538.**

**Halio'tis.** Same as **Abalone.**

**Hall, Asaph** (1829–1907). An Amer. astronomer; professor at Harvard Univ.; discovered 2 moons of planet Mars.

**Hall, Charles M.** (1863–1914). Amer. inventor, b. Ohio; invented electrolytic process for reducing aluminum, which made that metal, previously costly as silver, cheap enough for kitchen pots and pans.

**Hall, G. Stanley** (born 1846). Amer. educator and psychologist, president emeritus of Clark Univ.; b. Ashfield, Mass.

**Hall, John H.,** invents breech-loading rifle, **1254.**

**Hall, Austria,** town 6 mi. e. of Innsbruck; salt mines, **3574.**

**Hal'lam, Henry** (1777–1859). Eng. historian ('Europe During the Middle Ages'; 'Constitutional History of England'); father of Arthur Henry Hallam, subject of Tennyson's 'In Memoriam'.

**Halle** (*häl'ē*), Germany. City 20 mi. n.w. of Leipzig on Salle R.; pop. 183,000; large salt works; noted univ.

**Hal'leck, Fitz-Greene** (1790–1867). Amer. poet, b. Guilford, Conn.; remembered for two lyrics, 'Marco Bozzaris', and 'On the Death of Joseph Rodman Drake'.

**Halleck, Henry Wager** (1815–72). Amer. Civil War general, b. Westernville, N.Y.; succeeded McClellan in July 1862 as general-in-chief of all Union armies; superseded March 1864 by Grant.

**Hallelujah** (*hăl-ĕ-lụ'yà*). A Hebrew word meaning "praise ye the Lord."

**Hal'ley, Edmund** (1656–1742), Eng. astronomer; predicted return of "Halley's comet," **850;** a friend of Newton, **2478.**

**Halley's comet,** a comet whose orbit makes it visible to earth every 75 years, **850, 849,** *picture,* **851;** named for Edmund Halley.

**Hall of Fame, 1566.**

**Hall of the Winds,** Jaipur, India, *picture,* **1742.**

**Hallowe'en** (*hăl-ō-ēn'*), the evening of Oct. 31, **1566.**

**Hallstatt** (*häl'shtät*). Town of Upper Austria on L. Hallstatt; old and famous salt mines; anc. Celtic remains of Iron and Bronze Ages, dating back 3000 years or more.

**Halogens** (*hăl'ō-ĝĕnz*), the related chemical elements fluorine, chlorine, bromine, and iodine, **755.**

**Hal'ophytes.** Plants which live in salt water environment.

**Hals** (*häls*), **Frans** (1580?–1666), Dutch painter, **1566–7;** 'The Assembly of the Arquebusiers', *picture,* **2640.**

**Hälsingborg,** Sweden. Same as **Helsingborg.**

**Hal'stead, Murat** (1829–1908). Amer. journalist, b. Ross, Ohio ('The Story of the Philippines').

**Halter hitch, 1939.**

**Ham.** Son of Noah; traditional ancestor of Hamites (Gen. vi, ix).

**Ham,** food value compared with milk, **2238.**

**Ham, East and West.** Suburbs of London, England, on e.; pop. E. Ham, 151,000; growth due to factories established to evade prohibitive enactments of London County Council.

**Hamadan** (*hä-mä-dän'*), town in w. Persia; pop. 30,000; **2734.**

**Hamadryad** (*hăm'à-drī-ăd*), or "king cobra," **817.**

**Hamadryad baboon, 2292.**

**Hamadryads,** wood nymphs in Gk. myth., **2546.**

**Hamah** or **Hama** (*hä'mä*). City of Syria on the Orontes, 110 mi. n. of Damascus; pop. 60,000; the Hamath of the Bible.

**Hamame'lis,** or witch-hazel, **3774.**

**Haman** (*hā'măn*), chief minister of Persian king Ahasuerus, **1179.**

**Ham'burg,** a republic and free city of Germany, on Elbe R.; 160 sq. mi.; pop. 1,200,000; **1567–8, 1579, 1107;** in Hanseatic League, **1576;** water front, *picture,* **1441.**

**Hameln** (*hä'mĕln*) or **Hamelin.** Town in n.w. Germany, 25 mi. s.w. of Hanover; famed as scene of legend of the Pied Piper.

**Ham'erton, Philip Gilbert** (1834–94). Eng. writer, painter, and art critic ('The Intellectual Life').

**Hamilcar** (*hä-mĭl'kär*) **Barca** (270?–228 B.C.), Carthaginian general, father of Hannibal and Hasdrubal, **1575, 330.**

**Ham'ilton, Alexander** (1757–1804), Amer. statesman, first sec. of treasury, **1568–9;** doctrines supported by Marshall, **2155;** duel with Burr, **543, 3637;** national viewpoint, **3604, 3677–8;** opposes Jefferson, **1882;** relations with John Adams, **13;** selects site of Paterson, N.J., **2694;** and tariff, **3437, 3678;** Washington supports policies, **3677–8.**

**Hamilton, Henry** (d. 1796), Brit. soldier, gov. of Detroit during Rev. War; later gov. of Canada and of Bermuda; **783, 2226.**

**Hamilton, Sir Ian** (born 1853). Brit. general; joined the army in 1872 and served until 1919; distinguished himself in S. Africa and India; commanded Dardanelles expedition in World War; wrote several volumes of poems besides 'Gallipoli Diary' and others on military subjects.

**Hamilton,** cap. of Bermuda Isls.; pop. 2600; **386.**

**Hamilton,** N.Y. Village 25 mi. s.w. of Utica; pop. 1500; Colgate Univ.

**Hamilton,** Ohio, city on Great Miami R., 20 mi. n. of Cincinnati; pop. 39,675; machinery, paper, safes; large trade in farm products; home of William Dean Howells, **1689.**

**Hamilton,** Ontario, mfg. center and port; pop. 115,000; **1569.**

**Hamilton, Mt.,** Calif., a peak of the Coast Range, 25 mi. e. of San José; observatory, **2552.**

**Hamilton College.** At Clinton, N.Y.; men; founded 1793 as academy, chartered as college 1812; arts, sciences, classics.

**Hamilton Inlet,** indentation of Labrador coast, estuary of Hamilton R.; potential water-power, **1948.**

**Hamilton** or **Grand River,** Canada. Chief r. of Labrador; flows e. 600 mi. into Melville L., extension of Hamilton Inlet on Atlantic coast.

**Hamites** (*hăm'ītz*), native race of N. Africa, **37, 3866.**

**Hamit'ic languages, 2771.**

**'Hamlet',** Shakespeare's greatest tragedy, **1569–70, 3191, 1164;** Hamlet's home at Elsinore, **880;** quotations from, **1570, 3192.**

**Ham'lin, Hannibal** (1809–91), Amer. anti-slavery statesman, b. Paris Hill, Me.; vice-president 1861–65; intimate friend and adviser of Lincoln; **2012.**

**Hamline University.** At St. Paul, Minn.; co-ed.; Meth. Episc.; founded 1854 at Redding, Minn., reopened 1880 at Hamline (between Minneapolis and St. Paul); liberal arts.

**Hammer,** tool, **3514, 3516;** pneumatic, **2847;** steam, **1826.**

**Hammerfest** (*hăm'ĕr-fĕst*), Norway, port on Arctic Ocean; pop. 2700; most northern town in World; *picture,* **2536.**

**Hammerhead shark, 3197.**

**Ham'mersmith,** England. Western borough of London; pop. 130,000; boat-building and other mfrs.; home of William Morris.

**Hammerstein** (*hăm'ĕr-stīn*), **Oscar** (1847–1919). Amer. opera and theater director, b. Germany; manager Manhattan Opera House, N.Y.; foremost in establishing Fr. opera in America.

**Ham'mond, John Hays** (born 1855). Amer. mining engineer, b. San Francisco; associated with Cecil Rhodes in S. Africa; sentenced to death after Jameson raid; since 1900 active in U.S. mining development.

**Hammond, John Hays, Jr.** (born 1888). Son of the above, b. San Francisco; inventor of many devices relating to radio telegraphy and telephony.

**Hammond,** Ind., mfg. and r.r. city on L. Michigan, adjoining Chicago; pop. 36,004; steel products, locomotives and cars, surgical instruments; **1760.**

**Hammurabi** (*hä-mu-rä'bē*) (about 2100 B.C.), king of Babylonia, organizer of empire and codifier of laws, **296.**

**Hamp'den, John** (1594–1643), Eng. Puritan patriot and statesman, **1570, 692.**

**Hampden-Sidney College.** Presb. college for men at Hampden-Sidney, Va.; founded 1776; arts and literature.

**Hampshire** or **Southampton,** county of England on s. coast; 1624 sq. mi., including Isle of Wight; pop. 950,000; ports Southampton, Portsmouth; **1160.**

**'Hampshire',** Brit. cruiser, **1930.**

**Hampshire,** breed of sheep, **3200.**

**Hampstead,** England. Metropolitan borough in n.w. of London; pop. 86,000; formerly noted for mineral springs; residence of first earl of Chatham, John Constable, George Romney, Sir Richard Steele, John Keats, Leigh Hunt.

**Hampstead Heath,** open space of 240 acres, in Hampstead, **2056.**

**Hampton, Wade** (1818–1902). Amer. (Confederate) general and statesman, b. Columbia, S.C.; raised and equipped "Hampton's legion"; elected gov. of S.C. 1876, ending "carpetbag" rule; U.S. senator 1878–91; U.S. commissioner of railroads 1893–97.

**Hampton,** Va. Town on Hampton Roads; pop. 6138; fish, oysters, crabs; Hampton Normal and Agricultural Institute.

**Hampton Court,** England, palace on Thames R. 10 mi. s.w. of London, *picture,* **1154.**

**Hampton Normal and Agricultural Institute,** school for negroes, **2435.**

**Hampton Roads,** channel between James R. estuary and Chesapeake Bay, Va., **716, 3647;** battle of *Monitor* and *Merrimac,* **2286–7;** conference, **3353.**

**Hamster,** a burrowing rat, possessing large cheek pouches, **2977;** altitude range, *picture,* **397;** fur, **1390.**

**Ham'sun, Knut** (born 1860), Norwegian novelist, 1920 Nobel prize-winner in literature ('Growth of the Soil'; 'Hunger'; 'Pan'); **3134, 2541.**

**Hamtramck** (*hăm-trăm'ĭk*), Mich., mfg. city adjoining Detroit; pop. 48,615 (3559 in 1910); wheels, iron and aluminum castings, automobile accessories; **1000.**

**Han,** important dynasty of China 206 B.C.–220 A.D., marked by increase in prosperity and advance in civilization, **745.**

**Hanau** (*hä'nou*), Germany. Industrial city on Main R. 10 mi. e. of Frankfort; pop. 37,000; Napoleon defeated Bavarians in 1813.

**Han'cock, John** (1737–93), Amer. patriot, first gov. of Mass., **1570–1;** Gage attempts to arrest, **1990;** burial place, **470.**

**Hancock, Winfield Scott** (1824–86), Union general in Amer. Civil War, **1571;** defeated for president, **1399.**

**Hancock,** Mich., copper-shipping port opposite Houghton on L. Portage, connected with L. Superior by canal; pop. 7527; foundries, woodworking plants, creameries, smelters; **1513, 2226.**

**Hand** (anatomy), **1571–2;** man's contrasted with ape's, *picture,* **153;** monkey's hand-like feet, **2288–9;** whale flippers, **3723.**

**Hand,** a unit of measure, **3715.**

**Han'del, George Frederick** (1685–1759), Ger.-Eng. composer, master of the oratorio, **1572–4,** *pictures,* **1573, 2378.**

**Handwriting, 1574.**

**Hang'chow** or **Hang-Chow-Foo,** China, 100 mi. s.w. of Shanghai; pop. 685,000; one of richest Chinese cities, **1574, 3234.**

**Hanging Gardens of Babylon,** one of the Seven Wonders, **3177–8,** *picture,* **3179.**

**Hankow',** the "Pittsburgh" of China, 600 mi. up the Yangtze from Shanghai; pop. Hankow dist. 1,500,000; **1574–5;** river life, **3827.**

**Hanks, Nancy** (d. 1818), mother of Abraham Lincoln, **2011, 2012.**

**Han'na, Marcus Alonzo** (1837–1904). Amer. merchant and politician, b. New Lisbon, Ohio; friend, adviser, and political backer of Pres. McKinley; U.S. senator 1897–1904; **793.**

**Hannah,** a pious Hebrew woman, wife of Elkanah and mother of the prophet Samuel, **2388.**

**Hannay** (*hăn'ā*), **James Owen.** *See in Index* **Birmingham, George A.**

**Han'nibal** (247?–183 B.C.), Carthaginian general, **1575–6, 651;** bust, *picture,* **3043.**

**Hannibal,** Mo., mfg. city and trade center on e. state border on Mississippi R.; pop. 19,306; scene of Mark Twain's boyhood and setting of his 'Huckleberry Finn' and 'Tom Sawyer'; **3569.**

**Hanoi** (*hä-noi'*), cap. and largest city of Fr. Indo-China, in n. on Songkoi (Red) R.; pop. 110,000; trade in silk, rice; **1777.**

**Hanotaux** (*ä-nō-tō'*), **Gabriel** (born (1853). Fr. politician and historian; 'History of Contemporary France', standard work in its field; edited 17-volume 'History of the French Nation'; was at various times minister of foreign affairs, and ardently supported Fr.-Rus. alliance; in 1921 delegate to League of Nations.

**Han'over,** a Prussian province in n.w. Germany; 14,862 sq. mi.; pop. 3,000,000; **1576.**

**Hanover,** cap of Ger. province of Hanover; pop. 300,000; **1576.**

**Hanover,** N.H., town on Connecticut R. 55 mi. n.w. of Concord; pop. 2300; Dartmouth College; **2454,** *picture,* **2455.**

**Hanover, House of,** line of Brit. rulers, **1428, 1576;** Act of Succession, **139;** becomes House of Windsor in England, **1430;** list of rulers, **1152.**

**Hanover College.** At Hanover, Ind.; co-ed.; founded by Presbyterians in 1827 but now non-sectarian; chartered under present name 1833; liberal arts.

**Hanseat'ic League,** medieval confederation of n. European cities for promotion of commerce, **1576;** and merchant gilds, **1460;** Bergen, **2532;** Danzig, **962;** Hamburg, **1568;** Riga, **3019.**

**'Hänsel und Gretel'** (*hĕn'zĕl unt grā'tĕl*), Ger. folk-tale, **1318;** opera, **2584.**

**Hansen** (*hän'sĕn*), **Gerhard Henrik Armauer** (1841–1912). Norwegian physician, discoverer of leprosy bacillus.

**Hanuman** (*hŭn-u-män'*), an E. Indian monkey, **2291–2,** *picture,* **2290.**

**Hanyang** (*hän-yäng'*), China, city adjoining Hankow, **1575.**

**"Happy City, The," 1319.**

**Hapsburg** (*hăps'bûrg*), famous Ger. princely family which supplied rulers for Austria, Spain, and Holy Roman Empire, **1576, 1578;** Austria, **273;** Bohemia, **447;** Charles V's possessions, **690;** decline under Francis Joseph I, **1354;** Fiume, **1286;** Germany, **1448;** Hungary acquired, **1360;** Netherlands, **2441–2, 697;** Switzerland, **3463–5, 3415;** Tuscany, **1294;** World War brings downfall, **3807–8.**

**Hara** (*hä'rä*), **Takashi** (1856–1921). First commoner to become prime minister of Japan (1918), and first prime minister directly responsible to parliament; previously leader of Seiyu-Kai (Liberal) party and three times minister of home affairs; assassinated.

**Hara-kiri** (*hä'rä-kē'rē*). Form of suicide in Japan; obligatory harakiri, formerly common, was abolished in 19th cent., but voluntary form is still sometimes practiced out of loyalty to a dead superior, to avoid dishonor in battle, or as protest against a national policy.

**Harald.** *See in Index* **Harold.**

**Har'bin** or **Kharbin,** China, r.r. center on Sungari R. in w.-cent. Manchuria; pop. 100,000; Rus. supply station in Russo-Japanese War; **2135.**

**Harbord, James G.** (born 1866). Maj.-gen., U.S. Army; enlisted as private 1889; chief of staff, A.E.F., May 14, 1917 to May 5, 1918; commanded Marine brigade June–July 1918, 2d Division July 1918; com-

manded services of supply **July** 1918 to May 1919.

**Harbor Grace,** Newfoundland. Second seaport of the isl., on Conception Bay, connected with St. Johns, 25 mi. w., by Newfoundland R.; pop. 4500; boots and shoes, cod-liver and seal oils, fish.

**Harbors and docks, 1578–9;** Africa, **33;** Europe, **1188;** formed by "drowned coasts," **2790;** Glasgow, **1470;** Hamburg, **1567–8, 1579;** importance to cities, **1413;** Liverpool, **2031;** Los Angeles, **2063;** New York City, **2496,** *picture,* **2490;** effect on settlement and commerce of N. Amer., **2514, 2517;** Seattle, **3169;** effect on commerce of S. Amer., **3286.**

**Harbor seal, 3166.**

**Har'court, Sir William Vernon** (1827–1904). Eng. statesman and debater; loyal lieutenant of Gladstone; home sec. 1880–85; as chancellor of exchequer 1892–95 introduced graduated income tax; after Gladstone's retirement 1894 he led Liberals in House of Commons, but disagreements with Rosebery led him to retire in 1898.

**Hardanger Fiord,** inlet 75 mi. long on w. coast of Norway, *map,* **2531.**

**"Hard Cider Campaign," 1594.**

**Harden, Maximilian** (born 1861). Ger. Socialist politician and journalist; one of earliest critics of militarism; several times imprisoned for attacking govt.; *Die Zukunft,* weekly newspaper he founded 1892, became one of the leading papers of Germany.

**Hardenberg** (*här'dĕn-bĕrĸ*), **Karl August, Prince** (1750–1822). Prussian statesman; with Stein, rebuilder of Prussia after Napoleonic wars; abolished serfdom.

**Hard'hack,** a plant, **3327.**

**Hardicanute'** (1019–42), king of England. Son of Canute; succeeded brother Harold 1040; brief reign marked by cruelty and oppression.

**Har'die, James Keir** (1856–1915). Brit. Labor leader and politician; a miner by trade; worked for Independent Labor party; first Labor member in Parliament 1892; chairman of Independent Labor party 1894–99; pioneer in international socialism.

**Harding, Warren Gamaliel** (born 1865), 29th president of U.S., **1580–2,** *pictures,* **1581, 3595.**—*Administration,* **1582;** Budget Bureau, **3598;** treaties ending World War, **3812;** Taft Chief Justice, **3429.**

**Hardinge of Penshurst, Charles Hardinge,** first **Baron** (born 1858). Viceroy of India 1910–16; put into effect Morley-Minto reforms; loyalty of India during World War largely due to universal esteem for viceroy; moved cap. to Delhi and held famous "durbar" 1911; his grandfather, Henry Hardinge, first Viscount (1785–1856), was gov.-gen. of India 1844–48.

**Hardin's Cave,** Ga., **1431.**

**Hardness,** how measured in minerals, **2248.**

**Hard soap, 3263, 3267.**

**Hardtack,** unsalted, unleavened hard bread, used by campers and soldiers, **498, 500.**

**Hard water, 3696.**

**Hardwick,** Vt., village 20 mi. n.e. of Montpelier; pop. 1550; **3633.**

**Hardy, Thomas** (born 1840), great Eng. novelist, noted for somber view of life, **1582, 1167, 2540.**

**Hare** or **Lepus,** a constellation; location, *chart,* **873.**

**Hare-lip, 1583.**

**Hares and rabbits, 1583–8;** altitude range, *picture,* **397;** care as pets, **2756–7;** evolutionary position, *diagram,* **128;** fur, **1389, 1390, 3528;** hares and rabbits distinguished, **1583, 2951;** inheritance of colors, **1642;** length of life, **126;** nest, *picture,* **2415;** pests in Australia and New Zealand, **269, 2500;** rodent characteristics, **3036;** story, 'How Mr. Rabbit Lost His Tail', **1586–8;** trapping, **3528–9.**

**Harfleur** (*är-flûr'*). Town in n. France 4 mi. e. of Havre; formerly important seaport; twice occupied by English in 15th cent.; pillaged by Huguenots in 1562.

**Hargreaves** (*här'grēvz*), **James** (1730–78), inventor of the spinning jenny, **1589;** and Arkwright, **210.**

**Haricot** (*hăr'ĭ-kō*), the kidney or French bean, **347.**

**Harlan, John Marshall** (1833–1911). Associate Justice of the U.S. Supreme Court from 1877 to his death; term of service exceeded only by Chief Justice Marshall; was a liberal constructionist of the Constitution and generally favored increase in Federal power.

**Harland, Henry** (1861–1905). Anglo-Amer. novelist, b. Petrograd, educated in U.S., lived later years in London; 'The Cardinal's Snuff-box' by far his best and most popular novel; edited *The Yellow Book.*

**Harlech** (*här'lĕĸ*). Anc. seaport in w. Wales; ruins of Harlech Castle, captured by Yorkists 1468.

**Harlem River,** N.Y., **2489,** *map,* **2488;** tunnels, **3552.**

**Harlequin** (*här'lĕ-kwĭn*). In old comedy and pantomime, conventional character in spangled motley, in love with Columbine.

**Harlequin,** a coral snake, **3260.**

**Harmo'dius,** Gk. youth, **1522.**

**Harmon'ica,** or mouth organ, **2383.**

**Harmo'nium,** musical instrument, *picture,* **2382.**

**Har'mony,** in music, **2378.**

**Harms'worth, Alfred.** *See in Index* **Northcliffe.**

**Har'nack, Adolf** (born 1851). One of the most stimulating and prolific of modern church historians, born in Russia, taught after 1889 at Univ. of Berlin, where he trained a generation of teachers who spread his ideas throughout Germany; claims absolute freedom in study of church history and New Testament; preaches practical Christianity as a religious life, not as a system of theology.

**Harned, Virginia** (born 1868). Amer. emotional actress, remembered for her creation of Trilby in the play of that name.

**Harney Peak.** Highest point of Black Hills, in s.w. of S. Dakota; 7242 ft.

**Harold I** (d. 1040), king of England; illegitimate son of Canute, upon whose death in 1035 he claimed and won crown in opposition to legitimate heir, Hardicanute; **1152.**

**Harold II** (1022?–66), king of England, **1589, 1595, 3739.**

**Harold I** (850–933), "Fair Hair," first king of united Norway, succeeded 872; conquered petty local kings, many of whom fled to harry and conquer elsewhere, as Rolf or Rollo the Ganger in Normandy; **1723.**

**Harold III Sigurdsson** (1015?–66), king of Norway, succeeded 1047; sought to conquer England with Tostig; fell at Stamford Bridge; **758.**

**Harp,** stringed musical instrument, **1589–91, 2381;** Aeolian, **30.**

**Harpagon** (*är-pă-gôn'*), the miser in Molière's 'L'Avare', **2279.**

**Harpe, Sieur Bernard de la,** Fr. explorer, **207.**

**Harper, William Rainey** (1856–1906), Amer. Semitic scholar and educator, b. New Concord, Ohio; first pres. of U. of Chicago 1891 to his death; Memorial Library, *picture,* **1734.**

**Harpers Ferry,** W.Va., town at junction of Shenandoah and Potomac rivers; pop. 713; **3581;** altitude, **3720;** John Brown's raid, **516.**

**Har'pies,** bird monsters in Gk. and Rom. myth., **1591.**

**Harpoon',** Eskimo, *picture,* **1176;** of Stone Age, *picture,* **3361.**

**Harpoon gun, 3726,** *picture,* **3724.**

**Harp shells, 3201,** *picture,* **3203.**

**Harp'sichord,** forerunner of piano, **2797,** *picture,* **2380.**

**Harpy eagle,** *picture,* **1053.**

**Har'raden, Beatrice** (born 1864). Eng. novelist who leaped into fame overnight with her first novel, 'Ships that Pass in the Night', published in 1893.

**Harran** (*hăr-răn'*), also **Haran,** or **Charran.** In Bible times a thriving city in n. Mesopotamia; Crassus slain by Parthians 53 B.C.; now in ruins.

**Harrar** (*hă-răr'*) or **Hurrur.** Largest city of Abyssinia; pop. 50,000; center of fertile coffee dist.

**Har'rier,** a dwarf foxhound, used to hunt hares, **1023.**

**Har'riman, Edward Henry** (1848–1909). Noted Amer. capitalist and railway organizer, b. Hempstead, N.Y.; obtained control of and rehabilitated the bankrupt Union Pacific 1898; failed in contest with J. J. Hill for control of Northern Pacific 1901, but dominated r.r. world before his death; methods created criticism; denounced by Roosevelt.

**Harris, Frank** (born 1856). Brit.-Amer. critic and author; naturalized citizen of U.S.; editor *Fortnightly Review, Saturday Review, Pearson's Magazine;* author 'The Bomb', 'The Man Shakespeare', and many masterly short stories.

**Harris, Joel Chandler** (1848–1908), Amer. author, b. Eatonton, Ga.; unsurpassed for humorous and truthful portrayal of negro character and folklore; **115.**

**Harris, William Torrey** (1835–1909), Amer. educator and philosopher, b. North Killingly, Conn.; U.S. commissioner of education 1889–1906.

**Harrisburg,** Pa., state cap. and mfg. city; pop. 75,917; **1591, 2721;** capitol, *picture,* **2719.**

**Harrison, (Thomas) Alexander** (born 1853), Amer. genre and landscape painter; brother of L. Birge Harrison; work characterized by luminous color and delicacy of line; his specialty is marines; **2634.**

**Harrison, Benjamin** (1740–91), Amer. patriot, father of William Henry Harrison; delegate to Congress 1774–77; gov. of Va. 1782–85; signs Declaration of Independence, **1593.**

**Harrison, Benjamin** (1833–1901), 23d president of U.S., **1591–3;** Blaine as sec. of state, **435;** McKinley tariff, **1592, 2103, 3437;** Oklahoma opened for settlement, **2573–4;** first forest reserve established, **1328, 1331;** Bering Sea arbitration, **3168, 1593;** Mafia troubles, **1593, 2471;** Hawaii asks annexation, **3606, 1605.**

**Harrison, (Lovell) Birge** (born 1854). Amer. painter; best known for his snow scenes.

**Harrison, Constance Cary** (Mrs. Burton Harrison) (1846–1920). Amer. novelist, b. Vaucluse, Va. ('A Daughter of the South'; 'Old-Fashioned Fairy Book'; 'Folk and Fairy Tales').

**Harrison, Frederic** (born 1831). Eng. historian, jurist, literary critic, and positivist philosopher; voluminous writer ('The Meaning of History'; 'Positive Evolution of Religion'; 'The Choice of Books'; 'Among My Books').
**Harrison, Henry Sydnor** (born 1880). Amer. novelist, b. Sewanee, Tenn. ('Queed'; 'V. V's Eyes').
**Harrison, William Henry** (1773–1841), 9th president of U.S., **1593–4**; gov. of Indiana territory, **1594, 1762, 3452**; in War of 1812, **1594, 3672**; election of 1840, **1594, 3570.**
**Harrison,** N.J. A suburb of Newark on Passaic R.; pop. 15,721; iron and steel; leather mfrs.; r.r. center.
**Har'rogate.** Fashionable inland watering place in n. England 15 mi. n. of Leeds; pop. 34,000; medicinal springs.
**Harrow,** a farm implement; disk type, *picture*, **47.**
**Harrow School,** famous Eng. school for boys at Harrow-on-the-Hill, 12 mi. n.w. of London; founded 1571; **3139.**
**Hart, Albert Bushnell** (born 1854). Amer. historian and educator, b. Clarksville, Pa.; professor at Harvard; author 'Formation of the Union', 'Essentials of American History', and numerous other works on history and govt.
**Hart, Sir Robert** (1835–1911). Anglo-Chinese statesman; inspector-general of imperial Chinese customs 1862–1907, placed Chinese national finance on solid footing.
**Harte, Francis Bret** (1839–1902), Amer. writer of stories of western life, **1594,** *picture*, **114.**
**Hartford, Conn.,** state cap. and mfg. center; pop. 138,036; **1595, 867**; Charter Oak, **868,** *picture*, **867**; first school for deaf, **970.**
**Hartford Convention,** of 1814, **3672–3, 3604, 2108.**
**Hartlepool** (*här'tl-po͝ol*), England. A borough and port on n.e. coast, comprised of Hartlepool (25,000) and its extension, W. Hartlepool (69,000); exports coal, iron ores; shipyards, iron and steel works.
**Hart'mann, Karl Robert Eduard von** (1842–1906). Ger. philosopher; taught that existence is evil, and happiness an illusion ('Philosophy of the Unconscious').
**Harts'horn,** or ammonia, **118.**
**Harun-al-Raschid** (*hä-ro͝on' äl-rä'-shēd*), Abbasid calif of Bagdad 786–809; scholar, poet, patron of learning, literature, and music, one of greatest princes of his day, but a poor administrator; hero of many stories in 'Arabian Nights', **168**; court at Bagdad, **305.**
**Haruno'bu, Suzuki** (1760?–1780), Jap. painter, one of the first great masters of the color print, **1876.**
**Harvard, John** (1607–38), Amer. clergyman, founder of Harvard Univ., **2165.**
**Harvard Peak,** Colo., one of the College Peaks, 108 mi. s.w. of Denver, **3036.**
**Harvard University,** the oldest institution of higher learning in U.S., founded 1636 at Cambridge, Mass.; Harvard College, the undergraduate portion; graduate schools of law, divinity, medicine and dentistry, business administration; **833**; Agassiz Museum, **42**; athletics, *pictures*, **831, 833**; medical school, *picture*, **2165**; observatories, **2552**; Radcliffe College, **829**; Rumford professorship, **1617**; stadium, **829.**
**Harvest ant,** **131.**
**Harvest festivals,** **3482.**
**Harvest-fly,** a species of cicada, **765.**
**Harvesting machinery,** **2095, 2983, 3493–4, 44**; for hemp, **1630,** *pictures*, **1631.**
**Harvestman,** or daddy-long-legs, a spider-like arachnid with unusually long legs, **3325, 3946.**
**Harvest mouse,** **2359.**
**Harvey, George Brinton McClellan** (born 1864), Amer. editor and diplomat; appointed ambassador to Gt. Brit. in 1921; relations with Wilson, **3744.**
**Harvey, William** (1578–1657), Eng. anatomist, who demonstrated circulation of blood, **438, 121**; persecuted, **1796.**
**Harwich** (*här'ich*), England. Town on e. coast, 65 mi. n.e. of London; pop. 14,000; port for passenger ships; fisheries, shipbuilding.
**Harz** (*härts*) **Mts.,** in w.-cent. Germany, **1595, 1439–40**; caves, **665**; canaries, **627.**
**Hasa** (*hä'sä*), **El,** dist. in e. Arabia on Persian Gulf; combined with Nedjed 1914 to form the Emirate of Nedjed and Hara; pop. 250,000; *map*, **232–3.**
**Hasan** (*hä'săn*) and **Husein** (*hu-sīn'*). Grandsons of Mohammed, sons of Fatima and Ali; killed 669 and 680 A.D. by adherents of the Ommayyad califs and revered as martyr saints by the Shiites.
**Has'drubal** (d. 207 B.C.), Carthaginian general, son of Hamilcar Barca and brother of Hannibal, slain at the Metaurus, **1575.**
**Hashish** (*hăsh'ēsh*) or **hasheesh,** a narcotic drug, **1630**; "assassins" named from, **236.**
**Has'sam, Childe** (born 1859), Amer. impressionistic painter, **2634.**
**Hassan ben Sabah** (*häs'ăn bĕn sä-bä'*) (d. 1124), founder of the sect of Assassins, **236.**
**Hastings, Warren** (1732–1818), first gov.-gen. of India, **1596, 1753**; administration in Calcutta, **573**; Burke impeaches, **540, 1596.**
**Hastings, Lord William** (1430?–83), Eng. soldier and confidential adviser of Edward IV; executed, **3017.**
**Hastings,** England. Port in Sussex, popular watering place, one of Cinque Ports; pop. 60,000; fisheries; **1596.**
**Hastings,** Neb., city 90 mi. w. of Lincoln; pop. 11,647; Hastings College; State Insane Asylum; agricultural center; **2432.**
**Hastings, battle of** (1066), **1595–6, 1589, 3739.**
**Hastings College.** At Hastings, Neb.; co-ed., Presb.; opened 1882; classics, sciences, philosophy, normal work, music, oratory.
**Hath'away, Anne** (1556–1623), wife of William Shakespeare, **3189, 3369.**
**Hats and caps, 1597–8, 1599**; army and navy, **3578,** *pictures*, **3576, 3577**; "beaver," **357**; cardinal's, **643**; Chinese, **749**; in history of costume, *pictures*, **899, 900**; Korea, **1942**; panamas, **1078**; U.S. manufactures, **1597, 864, 2720.**
**"Hats" and "Caps,"** Swedish political parties, **1598.**
**Hatshep'su** or **Ha'tasu** (about 1500 B.C.), queen of Egypt, **1105.**
**Hat'teras, Cape,** on easternmost isl. of N.C., separated from mainland by Pamlico Sound, **2518.**
**Hat'tiesburg,** Miss. Trade center for cotton-growing and agricultural dist., 87 mi. s.e. of Jackson in yellow pine belt; pop. 13,270; sawmills, cotton mills.
**Hat'to** (d. 970 A.D.), archbishop of Mainz; according to legend, devoured by rats; Mouse Tower, *picture*, **1446.**
**Hauberk** (*hą'bĕrk*), coat of mail, **214,** *picture*, **215.**
**Hauff** (*houf*), **Wilhelm** (1802–27). Ger. novelist and poet ('Lichtenstein'—a splendid historical novel).
**Haupt'mann, Gerhardt** (born 1862), one of greatest of modern Ger. dramatists; runs the gamut from Zola-like realism to mystic symbolism; **1036, 2513**; chief works, **1438.**
**Hausas** (*hou'säs*). African race of n. Nigeria; among most intelligent of cent. Africa; language widely spread through their activity as traders.
**Haussmann** (*ōs-măn'*), **George Eugène, Baron** (1809–91). Fr. official, prefect of Seine 1853–70; famous for rebuilding Paris with wide boulevards.
**Haute-lisse** (*ōt-lēs'*), a tapestry weave, **3434.**
**Havan'a,** cap. of Cuba, largest and most important city in W. Indies; pop. 365,000; **1598, 1600,** *pictures*, **1600, 936, 560**; Gorgas conquers yellow fever, **1490**; hurricane (1846), **936.**
**Havelock** (*hăv'lŏk*), **Sir Henry** (1795–1857), Eng. general; anecdote of his youth, **2550**; relieves Lucknow, **2075.**
**Havelok the Dane.** Hero of old Anglo-Danish romance, son of Birkabeyn (or Gunter), king of Denmark; set adrift on raft which bore him to Lincolnshire coast, England; rescued by Grim, a fisherman; married ward of king of Lincoln, and became king of Denmark and of part of England.
**Haverford,** Pa. Seat of Haverford College, 8 mi. n.w. of Philadelphia; pop. 6631.
**Haverford College.** Friends' institution for men at Haverford, Pa.; founded 1833; arts and sciences.
**Ha'verhill,** Mass., industrial center on Merrimack R., 33 mi. n. of Boston; pop. 53,884; scene of many Indian attacks; noted for mfr. of boots and shoes; **2165**; birthplace of Whittier near by, **3736.**
**Havre** (*äv'r*) or **Le Havre,** 2d seaport of France, at the mouth of the Seine R.; pop. 140,000; **1601, 1344, 1348, 1578.**
**Haw,** fruit of the hawthorn, **1607.**
**Hawaiian** (*hä-wī'yăn*) or **Sandwich Islands,** group of Polynesia in Pacific Ocean; 6449 sq. mi.; pop. 255,912; cap. Honolulu; **1601–5**; annexation to U.S., **2104, 791**; coffee, **824**; early explorations, **1604–5, 874**; government, **3601**; Hawaiian Park. **2400**; history, **1605**; Kilauea, **1604,** *pictures*, **1602, 3658, 3660**; the land and its resources, **1601–4**; racial characteristics, **2620–1**; sugar plantation, *picture*, **3386.**
**Hawarden** (*här'dĕn*) **Castle,** **1469.**
**Hawash** (*hä'wäsh*), r. of s. Abyssinia, 500 mi. long, **4.**
**Hawk, 1605–7,** *pictures*, **403, 415**; eats field mice, **402**; eye, **1213**; head, *picture*, **410**; nest of sticks, **406,** *picture*, **407**; skeleton, *picture*, **3245**; used in falconry, **1220.**
**Hawkbill** or **hawksbill,** a sea turtle, **3563, 3520.**
**Hawker, Harry G.** (d. 1921), Brit. aviator, **63.**
**Hawkeye State,** **1803.**
**Hawkins, Sir Anthony Hope.** *See in Index* **Hope, Anthony.**
**Hawkins, Sir John** (1532–95), Eng. adventurer and admiral, half patriot, half pirate, first Eng. slave-trader; his plundering expeditions against Span. colonies and Port. slave-traders helped break down Span. pretensions to exclusive rights in the New World; and Drake, **1030**; takes first potato to England, **2900.**
**Hawkins, Sir Richard** (1562–1622). Eng. admiral, son of Sir John; commanded vessel in attack on the Spanish Armada.
**Hawk-moth,** **548.**

**Hawksmoor, Nicholas** (1661–1736), Eng. architect; worked so intimately with Wren that it is impossible to make exact division of credit for their work; **3719.**
**Hawkweed, 3712.**
**Hawthorn,** an ornamental shrub, **1607;** classified, **3533;** "crown-bearer" flowers, **3535;** in hedges, **1627.**
**Hawthorne, Julian** (born 1846). Amer. novelist, b. Boston, Mass.; son of Nathaniel Hawthorne ('Garth'; 'Sebastian Strome'; 'A Fool of Nature').
**Hawthorne, Nathaniel** (1804–64), Amer. novelist, **1607–9, 114, 2541;** home at Concord, **856.**
**Hay, John** (1838–1905), Amer. statesman, diplomat, and writer, b. Salem, Ind.; sec. to Pres. Lincoln; home in Cleveland, **793;** sec. of state (1898–1905), **2103, 2327, 3062;** negotiates Hay-Pauncefote treaty, **1668;** life of Abraham Lincoln, **2016;** wrote novel, 'The Bread-Winner'; and volume of poems, 'Pike County Ballads'.
**Hay,** dried grass or other plants as fodder, **1609;** alfalfa, **88–9;** from peanut plants, **2700;** spontaneous combustion, **1249.** *See also in Index* **Forage crops.**
**Hay'dn, Franz Joseph** (1732–1809), Austrian composer, **1609, 2379, 2405.**
**Hayes, Rutherford Birchard** (1822–93), 19th president of U.S., **1610–1;** election dispute, **1610, 2072.** —*Administration,* **1611;** Greenback party, **2871, 1611;** civil service reform, **222;** reconstruction ended, **780, 3605.**
**Hayes River,** Manitoba, rises near L. Winnipeg and flows 300 mi. to Hudson Bay, *map,* **602–3.**
**Haymarket Riot,** at Chicago, **791.**
**Hayne** (*hān*). **Robert Young** (1791–1839), Amer. statesman, b. S.C.; ardent nullification advocate; best remembered as having elicited, 1830, Webster's 'Reply to Hayne'; **3710, 1857.**
**Haynes, Elwood** (born 1857), Amer. inventor, b. Portland, Ind.; **276;** his first automobile, *picture,* **274.**
**Hay-Pauncefote** (*pąns'fōt*) **Treaty.** Negotiated 1901 between U.S. and Gt. Brit.; abrogated Clayton-Bulwer Treaty and provided for construction of Panama Canal by U.S. and its permanent neutralization.
**Hays, Will H.** (born 1879). Amer. lawyer, b. Sullivan, Ind.; appointed postmaster-general by Pres. Harding March 1921; resigned March 1922 to become national director of motion picture industry.
**Hazel,** bushy shrub related to the birches, **1611.**
**Ha'zen, William Babcock** (1830–87). Amer. general and chief signal officer, b. West Hartford, Vt.; raised scientific standard of signal service, introduced "cold wave" signals, and suggested standard time meridians.
**Hazleton,** Pa. Summer resort and industrial center 20 mi. s. of Wilkes-Barre; pop. 32,277; large anthracite coal interests; makes silk, clothing, macaroni, foundry products, lumber.
**Haz'litt, William** (1778–1830), Eng. critic and essayist; whatever his theme, he derives the essence of his commentary from himself, being in turn metaphysician, moralist, humorist, painter of manners and characteristics; friend of Lamb ('Characters of Shakespeare's Plays'; 'Table Talk'); **1178.**
**Head, Sir Edmund Walker, Baronet** (1805–68). Eng. writer on art and colonial gov.; lieut.-gov. of New Brunswick 1847–54; gov.-gen. Canada 1854–61.
**Head, Sir Francis Bond, Baronet** (1793–1875). Eng. soldier, author, colonial gov.; served in Waterloo campaign; managed gold and silver mines in S. Amer.; lieut.-gov. of upper Canada 1835–37; wrote 'Bubbles from the Brunnens of Nassau', 'Highways and Dryways', 'Stokers and Pokers'.
**Head.** *See in Index* **Brain; Skull.**
**Head-hunters,** of Borneo, **467–8;** of Formosa, **1332.**
**Head louse,** egg, *picture,* **1091.**
**Health.** *See in Index* **Hygiene.**
**Health Department, 1612–5;** disposal of sewage, **3183;** fighting mosquitoes, **2335–6, 2338;** U.S. Public Health Service, **3598.**
**Healy, George P. A.** (1808–94). Amer. portrait painter, b. Boston (portraits of Webster, Clay, Calhoun, and U.S. presidents from J. Q. Adams to Lincoln).
**Hearing.** *See in Index* **Ear.**
**Hearn** (*hērn*), **Lafcadio** (1850–94). Writer of Eng. books on Japan, unique in combination of truthful insight with literary art ('Kotto'; 'Glimpses of Unfamiliar Japan'; 'In Ghostly Japan'); cosmopolitan, b. Ionian Isls., son of Irish army doctor and Gk. mother; married Japanese and became citizen of Japan.
**Hearst, William Randolph** (born 1863). Amer. capitalist and journalist, b. San Francisco; owner of "string" of newspapers from San Francisco to New York and of a block of magazines; chief exponent of sensational journalism.
**Heart, 1615–7, 438,** *picture,* **2795;** in insects, **1787;** pulse, **2933;** of spider, *picture,* **3323;** strychnine stimulates, **3372.**
**Heartsease** or pansy, **2664.**
**Heart River,** N. Dakota, tributary of Missouri, *map,* **2524.**
**Heart-wood** of trees, **3532.**
**Heat, 1617–21, 2786;** affects evaporation and humidity, **1207, 1000;** bacteria produce, **303;** causes light, **1998;** causes winds, **3750–1;** cork an insulator, **888;** creates electricity in thermocouples, **1113;** effect on cloud formation, **809;** effect on crystals, **935;** electric current causes, **1114;** in electric furnace, **1383;** experiment with heated air, **53;** and fire, **1249–51;** freezing, **1362;** highest temperatures produced, **1618, 1383, 105, 7;** kills germs, **151;** latent, **3696;** lowest temperature known, **1618, 1629;** measuring high temperatures, **2941;** melting points, *table,* **1362;** and mercury, **2199;** of oxyacetylene torch, **7;** platinum resists, **2831;** quantity measured in calories, **1620, 587;** radiant, **1619–20, 3312;** specific, **1620, 3693, 3696;** of sun, **3693, 3696;** of thermit explosion, **105;** thermometers, **1620, 3486–7;** vacuum an insulator, **3614.**
**Heat engines,** machines which convert heat into mechanical energy, **1621;** include gas engines, **1403–6, 280–2;** steam engines, **3348–52, 3553–4.**
**Heat exhaustion,** or sunstroke, treatment, **1270.**
**Heath** (*hēth*). A sterile area covered by low shrubs, usually conifers and heaths; may be either excessively dry or excessively wet.
**Heath.** A small evergreen shrub related to heather; name often applied to heather.
**'Heathen Chinee',** poem, **1594.**
**Heather,** an evergreen shrub with red or white bell-like flowers, **1621.**
**Heath family** or *Ericaceae,* a large family of shrubs and vines, commonly found on poor land, including heaths, cranberries, and rhododendrons, **3942, 1621, 915.**
**Heating and ventilation, 1621–4, 1715–6,** *picture,* **1712;** electrical devices, **1116;** humidity, **1717, 1622, 1207;** in mines, **2250;** in Pompeian baths, **2876;** stoves and fireplaces, **3368.**
**"Heat" lightning, 2007.**
**Heaven,** the place or state of righteous souls after death; Dante's, **960–1;** Elysian Fields, **1558.**
**Heavenly Twins** or **Gemini,** a constellation of the zodiac, **3840;** location, *charts,* **873, 3343.**
**Heavysege** (*hēv'i-sēj*), **Charles** (1816–76), Canadian poet, b. England; wrote 'Saul', a poetic drama original in conception and containing many passages of striking beauty and power; **623.**
**"Heavy" soil, 3273.**
**Heb'bel, (Christian) Friedrich** (1813–63), Ger. poet and dramatist, one of greatest in 19th cent.; shows skill in characterization and true feeling for dramatic situations, but marred by occasional extravagances; chief works, **1438.**
**Hebe** (*hē'bē*), in Gk. myth., cupbearer to gods, **1624, 1393.**
**He'ber, Reginald** (1783–1826). Eng. churchman and hymn-writer, bishop of Calcutta ('Holy, Holy, Holy, Lord God Almighty'; 'From Greenland's Icy Mountains').
**Hebert** (*ā-bĕr'*), **Jacques René** (1755–94). Fr. revolutionist and atheist, **3028.**
**He'brew language and literature, 1624–5;** alphabet, **101;** belongs to Semitic group, **2771;** Bible, **387–91, 2923, 2027;** writing, **3816, 3817.** *See also in Index* **Bible.**
**Hebrews,** or Jews, **1889–92.** *See also in Index* **Jews.**
**Hebrews, Epistle to the.** The 19th book of the New Testament, a letter addressed to Christians of Hebrew birth, probably those living at Rome, about 65 A.D. The authorship is unknown but frequently attributed to Paul.
**Hebrides** (*hĕb'ri-dēz*) **Islands,** group of more than 500 isls. off the w. coast of Scotland; 2812 sq. mi.; pop. 79,000; **1625,** *maps,* **1159, 1152–3.**
**Hebron** (*hē'brŏn*), one of oldest cities of Palestine, 18 mi. s. of Jerusalem; pop. 18,000; tombs of patriarchs, **2644.**
**Hecate** (*hĕk'ă-tē*), in Gk. myth., goddess of moon, **1626.**
**Heceta, Bruno,** discovers Columbia R., **2596.**
**Hectare** (*hĕk'têr*), a unit in metric system (2.471 acres), **2206.**
**Hec'tor,** in Gk. myth., Trojan hero, **1626, 8;** death of, story retold from Homer, **1626–7.**
**Hector, Sir,** knight in Arthurian legends, **223, 224.**
**Hecuba** (*hĕk'yų-bà*), in Gk. myth., wife of Priam and mother of Hector, **1626, 2680.**
**'Hedda Gabler'** (*hĕd'à gä'blĕr*). Play by Ibsen; its heroine is one of the most hateful and unscrupulous egoists of literature.
**Hedgehog,** a spiny, insect-eating animal of Europe and Asia, **1627;** distinguished from porcupine, **2884;** hibernation, **1647.**
**Hedges, 1627–8.**
**Hedin** (*hā'dēn*), **Sven Anders** (born 1865). Swedish explorer of cent. Asia ('Central Asia and Tibet').
**Hedjaz.** Same as **Hejaz.**
**Hedley, William,** Brit. inventor; designs a locomotive, **2962.**
**He'donists,** a school of philosophers, **2772.**
**Heep, Uriah.** In Dickens' 'David Copperfield' a malignant hypocrite who calls himself "the 'umblest person going."
**Hegel** (*hā'gĕl*), **Georg Wilhelm Friedrich** (1770–1831). Ger. philosopher, founder of the school of absolute idealism.
**Hegira** (*hĕj'i-rà*), Mohammed's flight from Mecca (622 A.D.), from

which Moslem dates are calculated, **2276.**

**Heidelberg** (*hī'dl-bērg*), Germany, quaint univ. town on Neckar R.; pop. 61,000; **1628,** *picture,* **1445.**

**Heidelberg, University of,** Germany, **832, 1628.**

**Heidelberg man,** a type of man supposed to have existed in prehistoric times, **2133.**

**Heidelberg University.** At Tiffin, Ohio; co-ed.; founded 1850 by Reformed church; arts and science, music, art, oratory, commerce, pedagogy.

**Heifetz** (*hī'fĕts*), **Jascha** (born 1901), Rus. violinist; made first public appearance at 5 and before he was 18 had won recognition throughout world as master of violin; **1892.**

**Height of Land,** in Canada, **1970, 2583,** *map,* **602–3.**

**Heilbronn** (*hīl'brŏn*). Industrial town in s. Germany on Neckar R., 25 mi. n. of Stuttgart; pop. 44,000; fine Gothic church and Rathaus.

**Heilsberg** (*hīls'bĕrĸ*), Germany. Town in e. Prussia 38 mi. s. of Königsberg; indecisive battle between French and allied Russians and Prussians 1807.

**Heine** (*hī'nĕ*), **Heinrich** (1799–1856), Ger. poet, **1628–9, 1438, 1892,** *picture,* **1435.**

**Hejaz** (*hĕj-ăz'*) or **Hedjaz,** kingdom in Arabia on Red Sea; 100,000 sq. mi.; pop. 750,000; independence from Turkey recognized by treaty of Sèvres 1920; cap. Mecca; **166,** *maps,* **232–3, 165;** Mecca, **2186–7;** Syrian claims, **3426.**

**Hek'la** or **Hecla.** A volcano in s.w. Iceland; height 5100 ft.; becomes active at irregular intervals.

**Hek'togram,** a unit in metric system (3.527 oz.), **2206.**

**Hek'toliter,** a unit in metric system (26.42 gals.), **2206.**

**Hek'tometer,** a unit in metric system (328 ft. 1 in.), **2206.**

**Hel'ena, Saint** (247?–327? A.D.), mother of Constantine the Great; legendary discoverer of the Holy Cross; **870;** tomb, **1202,** *picture,* **1205.**

**Helena,** Ark. Shipping point on Mississippi R., 70 mi. below Memphis, Tenn.; pop. 9112; lumber, cottonseed oil, foundry products; scene of Federal victory July 4, 1863.

**Helena,** Mont., cap. in s.w. 48 mi. n.e. of Butte; pop. 12,037; in mining and stock-raising dist.; **2309, 2312;** capitol building, *picture,* **2311.**

**Helen of Troy,** in Homer's 'Iliad', most beautiful woman in Greece, daughter of Zeus and wife of Menelaus, king of Sparta; cause of Trojan War, **3542, 3544.**

**Helgoland** (*hĕl'gō-länt*), Ger. isl. in North Sea, **1629 3796.**

**He'liades,** in Gk. myth., daughters of Helios, **2759.**

**Helian'thus,** sunflower genus of plants, **3397.**

**Helicon** (*hĕl'ĭ-kŏn*), anc. name of a peak or mt. range in Boeotia, Greece; on the e. slope were a grove and temple sacred to the Muses; **2373;** sacred spring, **2707.**

**Helicon,** brass wind-instrument resembling Fr. horn; *picture,* **2382.**

**Heligoland.** Same as **Helgoland.**

**Heliogabalus** (*hē-lĭ-ō-găb'ā-lŭsē* or **Elagabalus** (205–222 A.D.). Dissolute Rom. emperor, proclaimed 218 A.D.; introduced into Rome worship of Syrian sun-god whose namesake and high priest he was; assassinated.

**He'liograph,** a sunlight reflector used in signalling, **3233,** *picture,* **3455;** used by Napoleon, **3454.**

**Heliopolis** (*hē-lĭ-ŏp'ō-lĭs*). Anc. city at head of Nile delta, Egypt; once seat of sun-worship; also anc. name of Baalbek, Syria.

**He'lios,** in Gk. myth., sun-god, **2759;** Colossus of Rhodes, **3010, 3178,** *picture,* **3179.**

**He'liotrope,** a flowering plant, **1629.**

**Heliot'ropism,** the tendency to turn toward or away from light; seen in animals, **131;** in plants, **2827–8, 855.**

**Helium,** a gaseous element, **1629, 4042;** in balloons, **320;** discovered by spectroscope, **3312;** emanates from radium, **2959, 2960;** place in air, *picture,* **51.**

**Hell,** Dante's, **960;** Gk. Hades, **1558;** in Milton's 'Paradise Lost', **2244.**

**Hel'las.** Originally a small dist. in Thessaly ruled by Peleus, father of Achilles; later applied vaguely to all anc. Greece.

**Hellbender,** a salamander, **3112.**

**Hell-diver,** a grebe, **1515,** *picture,* **413;** name applied also to coot, **2961.**

**Hel'lebore,** name given to various plants related either to crowfoots or lilies; species called black, green, swamp, and white; black hellebore, *picture,* **2852.**

**Hellen.** Mythical founder of the Greeks, son of Deucalion and Pyrrha, father of Dorus (from whom came Dorians), and grandfather of Ion (Ionians) and Achaeus (Achaeans); myth probably first current about 8th cent. B.C., when feeling of national unity developed among Greeks.

**Hellenes** (*hĕl'lēnz*), name for anc. Greeks, **1520.**

**Hellen'ic languages, 2771.**

**Hellenistic Ages, 1525;** at Alexandria, **88;** literature, **1538.**

**Hel'lespont,** anc. name for Dardanelles, **963.**

**Hell Gate,** rocky narrow part of East R., New York City, **2488;** r.r. bridge, **506.**

**Helmer, Nora.** Heroine of Ibsen's 'A Doll's House'.

**Helmet, 214,** *pictures,* **214, 215.**

**Helmet shell, 3202.**

**Helm'holtz, Hermann von** (1821–94), Ger. physicist, physiologist, and mathematician; invented ophthalmoscope; eminent in nearly every branch of science; conservation of energy, **2959.**

**He'loderm,** a poisonous lizard, **2037.**

**Héloise** (*ā-lō-ēz'*) (1101?–64), talented Fr. abbess, celebrated for her devotion to Abelard, **2.**

**'Héloise, The New',** novel by Rousseau, **3071.**

**Hel'otism,** in botany, the enslavement of one plant by another, **1994.**

**He'lots,** Spartan serfs, **3309.**

**Helsing'borg** (*hĕl'sĭng-bŏrĸ*) or **Hälsing'borg,** seaport and 5th city of Sweden; pop. 46,000; in s. opposite Elsinore, Denmark; had important part in Scandinavian wars; **3403.**

**Helsingfors** (*hĕl'sĭng-fōrs*) or **Helsin'ki,** largest city and cap of Finland; pop. 187,000; on Gulf of Finland; protected by fortress of Sveaborg; publishing and mfg.; univ., **1248.**

**Helsingör** (*hĕl-sĭng-gûr'*), Denmark. Same as **Elsinore.**

**Helvetian** (*hĕl-vē'shăn*) or **Helvet'ic Republic.** Swiss republic formed by French 1798; lasted until recognition of Swiss independence by Congress of Vienna, 1814.

**Helvetii** (*hĕl-vē'shĭ-ī*). Celtic tribe originally dwelling in what is now s.w. Germany; later, according to Caesar, they lived in what is now w. Switzerland; Caesar defeated them 58 B.C.

**Helve'tius, Claude Adrien** (1715–71). Fr. encyclopedist and utilitarian philosopher; his most famous book, 'De l'esprit ("Of the Spirit"), raised a storm, was condemned by the Sorbonne, and publicly burned.

**Hemans** (*hĕm'ănz*), **Felicia Dorothea** (1793–1835). Eng. poet whose sweet sentimental, sometimes insipid, lyrics include household classics like 'The Landing of the Pilgrims' and 'Casabianca'.

**Hem'atite,** an iron ore, usually red, **1817;** Ala. deposits, **426–7;** Minn. deposits, **2254.**

**Hematox'ylin,** the coloring matter of logwood, **2047.**

**Hemings, John** (d. 1630), Eng. actor, close friend of Shakespeare, **3191.**

**Hemip'tera,** the order of true bugs, or insects with sucking beaks, **1788, 3946;** aphids, **154;** chinch bugs, **752;** cicadas, **764–5;** scale insects, **3132–3;** water-bugs, **3696, 3698.**

**Hem'ispheres,** of human brain, **491.**

**Hemispheres,** of earth, seasons in, *picture,* **1063.**

**Hem'lock,** an evergreen cone-bearing tree with flat, blunt needles, **1629–30;** amount cut annually, **3590;** bark used in tanning, **1976;** distinguished from other conifers, **3539;** favored for hedges, **1628.**

**Hemlock or poison hemlock,** a poisonous plant of the parsley family, with spotted stem and small white flowers, **2854, 1630.**

**Hemlock, water,** a tall poisonous plant of the parsley family, **2854.**

**Hemming, 3185–6.**

**Hemoglobin** (*hĕm-ō-glō'bĭn*), the coloring matter of red corpuscles, **2999.**

**Hemorrhage** (*hĕm'ō-rāj*), violent bleeding; first aid for, **1269–70;** stopped naturally by clotting, **437–8.**

**Hemp, 1630–1;** in Ky., **1917;** Manila "hemp," **2768–9, 1630,** *pictures,* **3064;** rope and twine, **3063–5;** sisal, **3244, 1630.**

**Hem'pel, Frieda** (born 1885). Ger. coloratura soprano, with Metropolitan Opera Co. since 1912.

**Hen** (domestic fowl), **2908–11.**

**Hen, sage,** a large grouse, **1545.**

**Henbane,** a hairy, poisonous plant of the nightshade family; *picture,* **2853.**

**Henderson, Arthur** (born 1863). Brit. Labor leader; member of Parliament; pres. board of education 1915; Labor adviser to govt. until 1917; strong advocate of Labor internationalism.

**Henderson,** Ky. Port on Ohio R. 10 mi. below Evansville, Ind., in timber and coal region; pop. 12,169; tobacco market; textiles, flour, lumber.

**Hendricks, Thomas Andrews** (1819–85), Indiana congressman, senator, and gov.; b. near Zanesville, Ohio; vice-president of U.S., **790, 3636.**

**Henequen** (*hĕn'ĕ-kĕn*), a sisal plant, **3244, 1630;** Yucatan production, **2214.**

**Hen'gist and Hor'sa.** Chieftains of first Saxon settlers (449? A.D.) in England; regarded by some authorities as legendary characters.

**Henley, William Ernest** (1849–1905). Brit. poet, critic, and dramatist ('London Voluntaries'; 'Hospital Sketches'); author of the unforgetable lines; "I am the master of my fate, I am the captain of my soul"; collaborated with R. L. Stevenson in several plays.

**Henley-on-Thames,** England. Town 36 mi. w. of London famous for its beautiful situation and its annual regattas; pop. 7000.

**Hennepin** (*ĕn-păn'*). **Louis** (1640?–1706?), Fr. missionary and explorer, **1632, 1736, 2265.**

**Henner** (*č-nâr'*), **Jean Jacques** (1829–1905). Fr. painter, called "Modern Correggio" because of fondness for soft flesh tints and warm shadows.
**"He nothing common did, or mean," 693.**
**Hen pigeon,** *picture*, **2804.**
**Hen'ri, Robert** (born 1865), Amer. portrait, figure, and landscape painter, leader of radical movement; b. Cincinnati; **2634.**
**Henrietta Maria** (1609–66), Fr. princess, queen of Charles I of England; **691;** gave name to Maryland, **2163.**
**Henry I** (1068–1135), king of England, **1633, 3739–40.**
**Henry II** (1133–89), England, **1633–4, 1195, 3015;** contest for crown, **3352;** and Thomas Becket, **358;** extends jury system, **1905;** conquers Ireland, **1808, 888;** conspiracy against, **1896;** burial place, **2513.**
**Henry III** (1207–72), England, **1634, 1896;** quarrels with Simon de Montfort and the Barons, **2316.**
**Henry IV** (1367–1413), England, **1634;** overthrows Richard II, **3016;** founds Lancastrian line, **1959;** revolt of Wales, **3664.**
**Henry V** (1387–1422), England, **1634, 694;** at Agincourt, *picture*, **1635;** and Hundred Years' War, **1700, 42.**
**Henry VI** (1421–61), England, **1634–5;** in Wars of the Roses, **3066, 3068;** loses Fr. possessions, **1700;** founds Eton College, **3752;** murdered, **1088, 3016.**
**Henry VII** (1457–1509), England, **1635, 3547, 1153;** gains throne, **3017, 3068;** refuses aid to Columbus, **846, 561;** John Cabot, **561–2, 2450;** and Sir Thomas More, **2325;** founds Star Chamber, **3344;** chapel, in Westminster Abbey, **3719.**
**Henry VIII** (1491–1547), England, **1635–6;** Anne Boleyn, **447;** "Great Bible," **389;** shows favor to Holbein, **1673;** Sir Thomas More, **2325;** postal system, **2896;** Wolsey, **3776.**
**Henry I** (1011–60), king of France, **1636.**
**Henry II** (1519–59), France, **1636.**
**Henry III** (1551–89), France, **1636–7.**
**Henry IV** (1553–1610), France, called Henry of Navarre, **1637, 2763, 826;** issues Edict of Nantes (1598), **1696, 1637.**
**Henry I, "the Fowler"** (876–936), Holy Roman emperor, **1632.**
**Henry II** (972?–1024), emperor, **1632.**
**Henry III** (1017–56), emperor, **1632, 1541, 1988.**
**Henry IV** (1050–1106), emperor, **1632–3, 1541, 1447.**
**Henry V** (1081–1125), emperor, **1633.**
**Henry VI** (1165–97), emperor, **1633.**
**Henry VII** (1262–1313), emperor, **1633.**
**Henry Fitz Henry** (1155–83). Second son of Henry II, and subsequently heir to Eng. throne; intrigued against father and died warring against brother Richard; celebrated for knightly exploits.
**Henry of Blois** (1101–71). Bishop of Winchester and papal legate, brother of King Stephen; quarreled with latter upon refusal of primacy and for a time supported Matilda's claims to throne.
**Henry of Navarre.** *See in Index* **Henry IV** (France).
**Henry the Lion** (1129–95), duke of Saxony and Bavaria, son of Henry the Proud; son-in-law of Henry II of England; by series of wars extended power of his duchies in face of opposition of Hohenstaufen emperors; **3132, 1546.**
**Henry the Navigator** (1394–1460), **1638–9, 36;** extends Portuguese empire, **2888, 2889;** influence on Columbus, **846.**
**Henry the Proud** (1108?–39), duke of Saxony and Bavaria; died fighting to hold his duchies against Conrad III whose enmity he had earned by participating in a war against the Hohenstaufens; **3132.**
**Henry, Alexander** (1739–1824), Canadian fur-trader, traveled between Montreal and Rockies; published account of adventures; **623.**
**Henry, Sir Edward** (born 1850), Eng. police official, originated filing system of finger prints, **1247.**
**Henry, Joseph** (1797–1878), Amer. physicist, b. Albany, N.Y.; developed methods for weather forecasting; discovered oscillatory nature of Leyden jar discharge, **1114;** improved electromagnet, **1121.**
**Henry, O.,** pen name of William Sydney Porter (1862–1910), Amer. short-story writer, **2884–5.**
**Henry, Patrick** (1736–99). Amer. Rev. orator and political leader, **1637–8,** *picture*, **1881;** commissions George Rogers Clark, **783;** opposes Constitution, **2107, 3593;** quoted, **116.**
**Henry, Cape,** a point of land at entrance to Chesapeake Bay, **3122.**
**'Henry Esmond',** novel by Thackeray, **3479, 2542.**
**Hen'schel, Sir George** (born 1850). Eng. musical director, composer, and singer; first conductor of Boston Symphony Orchestra 1881–84; founder and conductor of London Symphony Orchestra 1884–95; concert tours with his wife; chief works are 'Stabat Mater', an oratorio; 'Nubia', opera; 'A Sea Change', comic opera; also wrote many songs and piano pieces.
**Henson, Josiah** (1787–1883), Amer. negro clergyman; his life furnished basis for 'Uncle Tom's Cabin', **3368.**
**Henson, Matthew A.,** a negro servant of Rear Admiral Peary, **2704,** *picture*, **2862.**
**Hen'ty, George Alfred** (1832–1902). Eng. author, soldier, and war correspondent; prolific writer of boys' adventure stories, clean and exciting but not of great literary merit; of his 80-odd books some of the best are 'In Freedom's Cause'; 'Under Drake's Flag'; 'In Times of Peril'; 'The Lion of the North'; 'By Pike and Dyke'.
**Hepat'ica** or liverleaf, a plant of the crowfoot family, with liver-shaped leaves. **1639, 1076.**
**Hepaticae** (*hĕ-păt'ĭ-sē*), a class of primitive plants, including liverworts, **2032, 3938.**
**Hepat'ic artery, 2031.**
**Hepburn law, 3060.**
**Hephaestus** (*hē-fĕs'tŭs*), in Gk. myth., god of fire and metal-working, **1639, 1971;** makes armor of Achilles, **9;** weds Aphrodite, **155;** and Cyclops, **944.**
**Hep'plewhite, George** (d. 1786), Eng. furniture maker, whose delicate graceful chairs were lighter and smaller than Chippendale's and had typically straight slender legs: his pieces were characterized by simplicity and most refined elegance; **1384.**
**Heptam'eron** (Gk. "seven days"). Collection of short stories made by various writers at court of Marguerite of Valois (or Navarre); modelled on Boccaccio's 'Decameron'; often cynical and licentious but important in history of Fr. literature.
**Heptateuch** (*hĕp'tà-tūk*). The first seven books of the Old Testament.
**Hera** (*hē'rà*), in Gk. myth., queen of the gods, wife of Zeus, **1639, 3839, 3607;** and Callisto, **872;** hostile to Hercules, **1640;** jealous of Io, **1802;** judgment of Paris, **3542.**
**Heracle'a, battle of** (280 B.C.), **2941.**
**Heracles** (*hĕr'à-klēz*) or **Herakles.** Same as **Hercules.**
**Heraclitus** (*hĕr-à-klī'tŭs*) (540?–475? B.C.). Gk. philosopher, called founder of metaphysics; taught that constant change from being to not-being is fundamental principle of universe; sometimes called the Weeping Philosopher.
**Heraclius** (*hē-rā'klĭ-ŭs*) (575?–642). Byzantine emperor; defeated Chrosroes II, emperor of Persia.
**Herald, 1639.**
**Heraldry,** science of armorial bearings, **1639;** flag emblems from, **1287.**
**Herat** (*hē-rät'*), fortified city in w. Afghanistan, of strategic importance; pop. 20,000; caravan center; once important city, cap. of Timur's empire; **31**
**Herbart** (*hĕr'bärt*), **Johann Friedrich** (1776–1841), Ger. philosopher, psychologist, and educator; view of apperception, **160;** vocational education, **3655.**
**Herbert George** (1593–1633). Eng. poet, saintly pastor of Bemerton, **1164.** 'The Temple' is full of quaint artificialities but contains some of the most treasured Eng. sacred lyrics.
**Herbert, Victor** (born 1859), Amer. composer and musical director, b. Dublin; grandson of Samuel Lover, the novelist; chief works, **2381.**
**Herbiv'orous animals,** those adapted to eating vegetable food; include ruminants, **3082–3;** tongue structure, **3513.**
**Herb Robert,** flowering plant, **1435.**
**Herbs, flavoring, 3319, 2257–8.**
**Herculaneum** (*hĕr-kū-lā'nē-ŭm*), anc. Rom. city at foot of Mt. Vesuvius, buried with Pompeii 79 A.D.; valuable antiquities revealed by excavations; **2877–8, 1533.**
**Hercules** (*hĕr'kū-lēz*) or **Heracles,** hero in Gk. and Rom. myth., **1640–1;** pupil of Chiron, **679.**
**Hercules,** constellation, **243, 872.**
**Hercules, Pillars of** (Gibraltar), **1458.**
**Hercules-beetle, 371,** *picture*, **367.**
**Her'der, Johann Gottfried von** (1744–1803), Ger. critic, philosopher, and poet; chief works, **1438;** influences Goethe, **1478, 1436.**
**Heredia** (*ā-rā'dē-à*), **José de** (1842–1905), Fr. poet, b. Cuba; "the modern master of the Fr. sonnet."
**Hered'ity,** transmission of qualities from parents to offspring, **1641–4, 398;** and environment, **1644;** Darwin's pigeon experiments, **2804;** eugenics, **1187;** Mendel's laws, **1642, 1644;** qualities transmitted by cell chromatin, **1641–2, 394,** *pictures*, **1643, 395;** "reversion to type," **1483, 1277, 2804.**
**Her'eford,** breed of cattle, commonly red with white markings, **663,** *picture*, **49.**
**Herefordshire.** Inland county in s.w. England on Wales border; 840 sq. mi.; pop. 111,000; cap. Hereford.
**"Here lies one whose name was writ in water," 1914.**
**Herero** (*hā-rā'rō*). A Bantu people of the Southwest Africa Protectorate; chief occupation cattle-raising.
**Her'esy,** teaching opposed to established religion or religious authority; Arian, **763, 88, 1902;** Huss burned for, **1705;** Inquisition, **1780.**
**Hereward** (*hĕr'ĕ-wērd*) (11th cent.). Eng. patriot outlaw; led Saxon resistance until driven from fens of Isle of Ely by William the Conqueror; hero of Kingsley's 'Hereward the Wake'.
**Herford** (*hĕr'fŏrd*), **Oliver** (born 1863). Amer. artist, author, and humorist, b. England ('Kitten's Garden of Verses'; 'Child's Primer of National History').
**Hergesheimer, Joseph** (born 1880). Amer. novelist, b. Philadelphia; given to psychological studies with complex social backgrounds ('The Three Black Pennys'; 'Java Head'; 'Cytherea').

**Her'kimer, Nicholas** (1715?–77). Amer. Rev. general fatally wounded at Oriskany.

**Herkimer,** N.Y. Village on Mohawk R. and Barge Canal, 14 mi. s.e. of Utica; pop. 10,453; knit goods, furniture, textiles.

**Hermann** or **Arminius** (17 B.C.—21 A.D.), Ger. chieftain, **1446.**

**Hermannstadt** (*hĕr'män-shtät*) or **Nagy-Szeben** (*nąd'yą sĕ'bĕn*), Rumania, industrial town 132 mi. n.w. of Bucharest; pop. 32,000; **3081.**

**'Hermas, Shepherd of',** apocryphal book of New Testament, **390.**

**Hermes** (*hĕr'mēz*), in Gk. myth., messenger of gods, **1644;** conducts Persephone from Hades, *picture,* **992;** invents lyre, **1589;** protects Odysseus against Circe's spells, **768;** slays Argus, **1802;** statue by Praxiteles, **1530,** *picture,* **3156.**

**Hermes Trismegis'tus** ("Hermes the thrice greatest"). Gk. name of Egypt. god Thoth; reputed author of Hermetic Books, encyclopedic works on Egypt. religion, art, and science.

**Her'mia,** in Shakespeare's 'Midsummer Night's Dream', daughter of Egeus, in love with Lysander, **2230.**

**Hermione** (*hĕr-mī'ō-nē*), in Shakespeare's 'Winter's Tale', wife of Leontes, **3756.**

**Hermit, 2298.**

**Hermitage,** art gallery in Petrograd, **2748,** *picture,* **3090.**

**Hermit crab,** a type that lives in an empty mollusk shell, **912, 914,** *picture,* **913.**

**Hermit-thrush, 3494.**

**Hermon** (*hĕr'mŏn*), **Mt.,** in Syria 30 mi. s.w. of Damascus; 9100 ft.; modern Jebel-es-Sheikh; **2643.**

**Hernani** (*ĕr-nä'nē*). Hero of tragedy of same name by Victor Hugo and opera founded on it by Verdi; romantic outlaw, who, on point of honor, ends life just as love, wealth, and high dignities are his.

**Herne, James A.** (originally James Aherne) (1840–1901). Amer. actor and dramatist, b. Cohoes, N.Y.; skilful in depiction of rural life and everyday types of character ('Shore Acres').

**Hero** or **Heron of Alexandria** (first cent. A.D.), Gk. mathematician and writer on mechanical and physical subjects, invents first steam engine, **3348.**

**Hero and Leander,** lovers in famous Gk. legend, **1645.**

**Her'od I, the Great,** king of Judaea 37–4 B.C., **1645, 387, 1887.**

**Herod Antipas,** tetrarch of Galilee 4 B.C.–39 A.D., **1645.**

**Herodias** (*hē-rō'dī-ąs*), wife of Herod Antipas, mother of Salome, and instigator of the beheading of John the Baptist, **1645.**

**Herodio'nes,** the wading-bird order, **412,** *picture,* **414;** storks and herons, **3362–5.**

**Herod'otus** (484?–425? B.C.), Gk. historian, the "father of history," **1645, 1537;** 'History' cited, **1074, 1098, 1099, 3023, 3242.**

**Hero'ic couplet,** a verse form, **2851;** used by Dryden, **1043,** Pope, **2879.**

**Heroin** (*hĕ-rō'ĭn*), a derivative of morphine, **2585;** first aid in poisoning, **2855.**

**Her'on,** a long-necked, long-legged wading bird, **3362–5, 1645,** *pictures,* **414, 2411;** care of young, **408;** nests built of sticks, **406,** *picture,* **407;** migration, **2231.**

**Her'onries,** nesting and breeding places of herons, **3364.**

**Hero stories,** as literature for children, **2027;** list, **2029.** *See also in Index* **Stories.**

**Herostratus** (*hĕ-rŏs'trą-tŭs*) (4th cent. B.C.), Ephesian who set fire to Diana's temple, **3178.**

**Herreshoff** (*hĕr'ĕs-hŏf*), **John B.** (1841–1915). Blind Amer. naval architect, b. Bristol, R.I.; member of a family of shipbuilders and founder of firm which designed America's Cup defenders.

**Her'rick, Myron T.** (born 1854). Amer. capitalist and diplomat; gov. of Ohio 1903–06; U.S. ambassador to France 1912–14; remained in Paris Sept. 1914 when Fr. govt. removed to Bordeaux, allaying panic and taking over embassies of other countries.

**Herrick, Robert** (1591–1674), Eng. lyric poet; 'Corinna's Maying', 'Night Piece to Julia', 'Gather Ye Rosebuds', and other delicate, exquisite, unimpassioned verse, published in volume 'Hesperides'; **1164.**

**Herrick, Robert** (born 1868). Amer. novelist, b. Cambridge, Mass.; professor at U. of Chicago; novels and short stories deal with modern life; realist ('The Common Lot'; 'Together'; 'A Life for a Life'; 'The Conscript Mother').

**Herrin,** Ill. Coal-mining center in s. of state 10 mi. n.w. of Marion; pop. 10,986; machine shops, foundries, powder plant.

**Herring,** a soft-finned food fish, **1645,** *picture,* **1245;** affected fortunes of Hanseatic League, **1576;** fisheries, **1285;** sold as sardines, **1285;** tarpon related, **3438.**

**Herring, lake,** or cisco, **3733.**

**Herring family** or *Clupeidae,* a family of soft-finned fishes, **1645;** includes herring, **1645,** sardines, **3126,** shad, **3188.**

**Herring gull, 1550,** *pictures,* **413, 1551.**

**Her'schel, Caroline** (1750–1848). Eng. astronomer, b. Germany, sister and devoted assistant of Sir William Herschel.

**Herschel, Sir John F. W.** (1792–1871). Eng. astronomer, son of Sir William Herschel; discovered 525 star clusters and nebulae not recorded by his father; made first telescopic survey of southern heavens; invented a process of photography on sensitized paper.

**Herschel, Sir William** (1738–1822), Eng. astronomer, b. Germany; developed study of fixed stars and discovered 5000 star clusters; proved motion of solar system through space; discovered planet Uranus, **244, 2818.**

**Herschel, Sir William** (1738–1822), Brit. official, son of Sir J. F. W. Herschel and grandson of Sir William Herschel; inventor of system of finger-print identification.

**Herschell, Farrar Herschell, first Baron** (1837–99). Lord Chancellor of England in 1886 and again 1892–95; pres. of Anglo-Amer. boundary commission 1898–99.

**Hertford College,** Oxford, **2610.**

**Hertfordshire** (*här'fôrd-shēr*). Inland county in s.e. England; 635 sq. mi.; pop. 327,000; cap. Hertford; agriculture.

**Hertogenbosch** (*hĕr'tō-gĕn-bŏs*). Same as **Bois-le-Duc.**

**Hertz, Heinrich** (1857–94), Ger. physicist, **1122, 1892;** confirmed Maxwell's theory concerning existence of ether ("Hertzian") waves, **3766;** studied cathode rays, **3824;** ether wave work led to radio telegraphy, **2145.**

**Hertzian waves,** waves similar to those of light, but varying from a few feet to several miles in length, in the ether of space, **3312;** used in radio, **3758, 3760–2, 3765–6;** named for Hertz, **1122.**

**Hervey Archipelago.** Same as **Cook Islands.**

**Herzegovina** (*hĕr-tsĕ-gō-vē'nä*), **468, 271–2;** annexed by Austria, **310;** in Jugo-Slavia, **1901, 307.**

**Herzen** (*hĕr'tsĕn*), **Alexander** (1812–70), Rus. author and publicist, whose political writings, secretly circulated in Russia, stirred up revolt against Rus. absolutism; influence on Rus. literature, **3097.**

**Herzl** (*hĕr'tsl*), **Theodor** (1860–1904). Hungarian Jew, founder of modern political Zionism, which advocates autonomous Jewish state in Palestine.

**"He serves his country best," 116.**

**Hesiod** (*hē'sĭ-ŏd*) (8th cent. B.C.), father of Gk. didactic poetry, **1535.**

**Hesperides** (*hĕs-pĕr'ĭ-dēz*), in Gk. myth., sisters, usually supposed to be four in number, symbols of love and fruitfulness; figure in stories of Cadmus, Thetis, and Atalanta; golden apples obtained by Hercules, **1640.**

**Hesse** (*hĕs'ē*), republic in s.w. Germany, grand duchy until 1918; 2966 sq. mi.; pop. 290,988; agriculture, lumber, wine; coal and iron; makes leather, cloth, chemicals; **1441.**

**Hesse-Cassel** (*hĕs-ē-käs'ĕl*) or **Electoral Hesse,** former Ger. landgraviate and electorate n. of Hesse-Darmstadt; joined Austria in Austro-Prussian War (1866); annexed by Prussia, **1448, 2929.**

**Hesse-Darmstadt** (*hĕs-ē-därm'shtät*). Name of Hesse until 1866.

**Hes'sian fly,** an insect pest of grain, **1645;** fossil ancestor found in amber, *pieture,* **106.**

**Hessians,** in Amer. Rev., **3003.**

**Hes'tia,** Gk. goddess of hearth and home; daughter of Kronos, **3607;** same as Rom. Vesta, **3634–5.**

**Hetch Hetchy Valley** (Calif.), a deep valley of the Sierra Nevada, in Yosemite National Park; now reservoir for San Francisco; **3832.**

**"He was not of an age, but for all time," 3191.**

**Hew'itt, Abram S.** (1822–1903), Amer. capitalist and political leader; man of fine public spirit and consistent advocate of good govt.; introduced open-hearth process of making steel into America; representative in Congress 1875–79, 1881–86; elected mayor of New York City, **3059.**

**Hew'lett, Maurice Henry** (born 1861), Eng. romantic novelist; 'The Forest Lovers'; 'Richard Yea and Nay'; 'The Queen's Quair'; 'Open Country'; time ranging from medieval to modern, scenes from Iceland to Italy, style flaming with color and sometimes fantastically archaic and naïve; **2541.**

**Hex'apods,** the class of six-legged arthropods, or insects, **1787, 3946.**

**Hex'ham.** Market town in n. England on Tyne R., 20 mi. w. of Newcastle; here Yorkists defeated Lancastrians in 1464; pop. 8417; gloves and coal.

**Heyse** (*hī'zē*), **Paul** (1830–1914), Ger. poet, novelist, and short-story writer; Nobel prize winner, 1910; master of the novelette; his stories usually consist of one incident polished and worked over till it stands out like a cameo; a pessimistic but progressive, radical thinker; **2541;** chief works, **1438.**

**Hezeki'ah** (8th-7th cents. B.C.), strong, righteous king of Judah, in whose reign "the Assyrian came down like a wolf on the fold," as Byron tells in 'Destruction of Sennacherib' (read II Kings xviii, xix, xxii); **1890.**

**Hiawatha** (*hī-ą-wä'thä*), legendary Indian chief, founder of the League of Six Nations (Iroquois), and promoter of the arts of peace. **2057;** Longfellow's story retold, **2059–61;** quotation from, **890.**

**Hibben, John Grier** (born 1861). Amer. educator, b. Peoria, Ill.; professor of logic at Princeton Univ. 1897–1912; prcs. since 1912.

**Hibbing,** Minn., village 60 mi. n.w. of Duluth in famous Mesaba iron ore range; pop. 15,089; 5 of country's largest mines lie within village limits; **2256.**

**Hiberna'tion, 1646–7;** among bears, **349;** frogs, **1374;** groundhogs, **1543;** honey bees, **363.**

**Hibernia** (*hī-bĕr'nĭ-ȧ*). Anc. Latin and poetical name of Ireland.

**Hibis'cus.** A large genus of plants of the mallow family, natives of warm climates, many with large showy flowers; some grown in U.S. as ornamental plants; fibers used in Oricnt for cordage and matting; fruit of okra or gumbo (*Hibiscus esculentus*) is used as food.

**Hich'ens, Robert Smythe** (born 1864). Eng. novelist and playwright ('Green Carnation'; 'The Garden of Allah'; 'Bella Donna'; 'The Dweller on the Threshold').

**Hick'ory,** a N. Amer. tree of the walnut family, **1647–9, 3534;** botanical classification, **3533;** pecan related, **2705.**

**Hidalgo** (*hī-däl'gō*), Mexico. State in cent. part; 8637 sq. mi.; pop. 655,000; cap. Pachuca; mining, textile mfrs.

**Hidalgo y Costilla** (*ē-däl'gō ē kōstē'lyȧ*), **Miguel** (1753–1811), Mex. patriot priest, venerated as a saint; leader of revolt, **2214.**

**Hidatsa** (*hē-dät'sȧ*) or **Minitari Indians.** Same as **Gros Ventres.**

**Hides, 1975–9.** *See also in Index* **Leather.**

**Hide-weed,** a seaweed, *picture,* **3170.**

**Hierat'ic writing,** a running form of Egypt. hieroglyphic writing, *pictures,* **101.**

**Hieroglyphics** (*hī-ĕr-ō-glĭf'ĭks*) or picture-writing, **1649, 3816, 100, 101;** Aztec, *pictures,* **289, 290;** translated by aid of Rosetta Stone, **1098–9,** *picture,* **1099.**

**Higginson, Thomas Wentworth** (1823–1911). Amer. author and Civil War soldier, b. Cambridge, Mass.; colonel of first regiment of freed slaves ('Young Folks' History of the United States'; 'Cheerful Yesterdays').

**"High,"** in weather forecasting, an area of high barometric pressure, **3708.**

**High, The,** street in Oxford, England, *picture,* **2611.**

**High German,** language, **1435.**

**Highland Park,** Mich., automobile mfg. suburb of Detroit; pop. 46,499; **1000.**

**Highlands,** the part of Scotland n. of the Grampians, **3146.**

**Highlands of the Hudson,** range of hills in s.e. N.Y., intersected by the Hudson R., **1692.**

**Highpoint,** N.C., city 70 mi. n.e. of Charlotte; pop. 14,302; safes, textiles, hosiery, street cars; furniture, **2519.**

**High relief, 3154.**

**High school, 3138–9.**

**High seas.** Ocean waters 3 mi. or more from shore not included in territorial limits of any nation.

**High-speed tools, 99, 3548.**

**Hilda** or **Hild, Saint** (614–680). Eng. abbess, descendant of royal Northumbrian line; founded monastery of Whitby.

**Hil'debrand.** *See in Indcx* **Gregory VII.**

**Hill, Ambrose Powell** (1825–65). Confederate general in Civil War; killed near Petersburg, Va.

**Hill, James Jerome** (1838–1916), Amer. r.r. magnate, **1649;** memorial library, **3111.**

**Hill, Sir Rowland** (1795–1879), Eng. administrator, author of uniform "penny" postal system, **2896, 2898, 1222.**

**Hill,** in physiography, **2790.**

**Hil'ler, Ferdinand** (1811–85). Ger. musical composer and director; friend of Mendelssohn.

**Hillsdale College.** At Hillsdale, Mich.; co-ed.; founded 1855 by Frec Baptist church; arts and sciences, music, home economics, business, theology.

**Hilo** (*hē'lō*), Hawaiian Isls., port on n.e. coast of Hawaii; pop. 10,431; **1603.**

**Himalaya** (*hĭ-mä'lȧ-yȧ*) **Mts.,** the loftiest mountain system on earth, between India and Tibet; 1500 mi. long; 20,000 to 29,000 ft. high; **1649–50,** *maps,* **1744, 232–3;** fossils, **1334;** Mt. Everest, **1207–8;** plant life, **1748;** scenes in, *pictures,* **229, 1745.**

**Himalayan bear, 355.**

**Himation** (*hĭ-măt'ĭ-ŏn*), Gk. garment, **897,** *picture,* **898.**

**Hind,** a female deer, **979.**

**Hin'denburg, Paul von** (born 1847), Ger. general. **1650–1;** crushes Rus. advance, **3794;** and Ludendorff, **2076;** offensive of 1918, **3804.**

**Hindenburg line,** a strong defensive zone of trenches and strong points constructed by the Ger. army in 1916, from a point near Soissons n. over Vimy Ridge to Lille; sometimes taken to include the general defensive from Soissons e. to Verdun; before Arras, **220, 3797;** broken in battle of the Argonne, **193–4.**

**Hindi,** dominant language of India, **1748.**

**Hin'duism, 1651, 1748;** animal food forbidden, **1752;** animals venerated, **1748, 2291–2, 3259;** Brahma, **486;** Caste system, **1651, 1750–1, 3123;** Ganges worshipped, **1393,** *picture,* **1743;** Himalaya Mts., **1650;** number of adhcrents, **2994;** pilgrimagcs to Benares, **380–2,** *picture,* **1743;** suttee, **1751.**

**Hindu Kush** (*hĭn'dụ kụsh*) **Mts.,** range in cent. Asia w. of Himalayas; highest point, 25,400 ft.; **226,** *map,* **31.**

**Hindu literature, 1755–6.**

**Hindustan',** Persian name for India, meaning "land of the Hindus"; used by natives for land n. of Vindhya Mts., or upper basin of the Ganges, **1745.**

**Hindusta'ni,** language of n. India, **1748, 2771;** number of people speaking, **2772.**

**Hines** (*hīnz*), **John L.** (born 1868), maj.-gen. U.S. Army; graduated U.S. Military Academy 1891; served in Span.-Amer. War and in Philippines; assistant adjutant general A.E.F. 1917; commanded First Brigade, first Division May–August 1918, 4th Division August–October 1918; appointed commander 3d Army Corps Oct. 11, 1918; in Meuse-Argonne, **194.**

**Hines, Walker D.** (born 1870). Amer. lawyer, b. Russelville, Ky.; director-general 1919–20 of U.S. railroads.

**Hin'nom, Valley of.** Same as **Gehenna.**

**Hiogo-Kobe** (*hē-ō'gō-kō'bā*). Japan. Same as **Kobe.**

**Hipparchus** (*hĭ-pär'kŭs*) (d. 514 B.C.), tyrant of Athens, **1522.**

**Hipparchus** (2d cent. B.C.). Gk. astronomer and mathematician, founder of trigonometry; discovered precession of the equinoxes and invented mcthod of fixing terrestrial positions by circles of latitude and longitude, thereby founding scientific geography.

**Hip'pias** (d. 490 B.C.), Athenian tyrant, **1522.**

**Hippocrates** (*hĭ-pŏk'rā-tēz*) (460?–377? B.C.), famous Gk. physician, called "father of medicine"; first to dissociate medicine from superstition and to insist on scientific study of disease; **2193.**

**Hippocrene** (*hĭp-ō-krē'nē*), spring sacred to Muses, **2707.**

**Hippol'yta,** queen of the Amazons; wore famous girdle given her by father, Ares; killed by Hercules, **1640.**

**Hippopot'amus,** or river horse, an amphibious mammal, **1651–3;** ancestral relations, **1336;** found in Africa, **4, 34;** related to hog, **1671;** teeth yield ivory, **1853.**

**Hi'ram,** king of Tyre about 1000 B.C.; contemporary of David and Solomon; raised Tyre to lcading position in Phoenician Confederacy; subjugated Cyprus; aids Solomon, **2774.**

**Hiram College,** at Hiram, Ohio; co-ed.; founded 1850; liberal arts; Garfield at, **1398.**

**Hiroshige** (*hē-rō-shē'gā*) (1797–1858), Japanese artist, **1876.**

**Hiroshima** (*hē-rō-shē'mä*). Port at s. end of Honshu Isl., Japan; opposite sacred isl. of Itaku-Shima; pop. 165,000; trade in lacquer ware, bronze, etc.

**Hiroshito** (*hē-rō-shē'tō*) (born 1901). Crown prince of Japan, appointed regent in 1921; exponent of liberalism; broke age-long precedent concerning heirs to throne by leaving native shores for trip through Europe in 1921.

**Hirpini** (*hĕr-pī'nī*). Anc. Samnite tribe of s. Italy; revolted from Rom. conquerors and joined Carthaginians in 2d Punic War; obtained Rom. franchisc after final defeat of Samnites by Sulla 83 B.C.

**Hirsch, Maurice, Baron de** (1831–96). Austrian financier and philanthropist; devoted millions to Jewish education, colonization, and charity in various countries.

**Hirundinidae** (*hĭr-ŭn-dĭn'ĭ-dē*), the swallow family of birds, **3399, 412.**

**Hispania** (*hĭs-pā'nĭ-ȧ*). Rom. name for Span. peninsula.

**Hispanio'la** ("Little Spain"), name given by Columbus to Haiti, **1561.**

**Hissarlik** (*hĭ-sär'lĭk*), place in Asia Minor on site of anc. Troy, **3543;** Schliemann's excavations, **3138.**

**"Hissing and clapping,"** game, **2838.**

**Histol'ogy,** science which studies body tissues microscopically, **121, 3841.**

**History, 1653–4;** beginnings as a science, **1537, 1645;** civilization, **771–5;** dates fixed by eclipses, **1074;** development from tradition, **1223;** first exact date in, **1099;** Macaulay's view of, **2094;** Marx's economic interpretation, **2157;** medieval chronicles, **763, 90;** relation of mythology to, **2386.** —*Charts,* **1655–8;** ancient, **1655–7;** medieval, **1658–9;** modern, **1659–61;** American (colonial and revolutionary), **1664–5;** United States, **1665–8;** Canadian, **1663;** World War, **1662.** For detailed study of history *see* Outlines, **3953–80;** also under names of countries.

**Hitches and knots, 1939–40.**

**Hittites** (*hĭt'ītz*), anc. people of Asia Minor, **1669;** costume, **1597;** invade Egypt, **1106;** use of iron, **1817.**

**Hivaoa** (*hē-vä-ō'ä*). A Pacific isl.; largest of the southern Marquesas.

**Hives,** a skin eruption; treatment for, **1270.**

**Hizen'ware,** a variety of Japanese pottery, **1874.**

**Hoang Ho.** Same as **Hwang River.**

**Hoar, George Frisbie** (1826–1904). Amer. statesman, b. Concord, Mass.; "Free Soiler" and anti-imperialist; representative and senator from Mass. 1869–1901; ability and long service gave him great influence. ('Autobiography of Seventy Years.).

**Hoar frost, 1376.**

**Hoatzin** (*hō-ăt'sĭn*), a S. Amer. bird showing curious resemblances to fossil archaeopteryx, *pictures*, **401.**

**Ho'bart, Garrett Augustus** (1844–99), Amer. Republican leader, b. Long Branch, N.J.; vice-president of U.S., **3636, 2104.**

**Hobart,** cap. and largest city of Tasmania, on s. coast, 12 mi. above mouth of Derwent R.; pop. 40,000; **3438, 3439.**

**Hobart College.** At Geneva, N.Y.; co-ed. (separate institution for women, William Smith College); present title since 1860 (Geneva College 1822); arts, philosophy, science.

**Hobbema** (*hŏb'ĕ-mä*), **Meindert** (1638–1709), Dutch landscape painter, greatest after Ruysdael; **2631;** 'Avenue of Middleharnis', *picture*, **2637.**

**Hobbes, John Oliver.** Pen name of Pearl Mary Teresa Craigie (1867–1906). Eng. novelist and dramatist, b. Boston, Mass.; her style is cynical, epigrammatic, especially in dialogue; wrote 'A Study in Temptations', 'Robert Orange', 'The Vineyard', 'Flute of Pan'.

**Hobbes, Thomas** (1588–1679). Eng. philosopher; derived society (a kind of artificial monster) from a contract between men endangered by clashing self-interests ('Leviathan').

**Hobkirk's Hill, battle of.** British defeated Americans under Greene 1781, n. of Camden, S.C.; also called 2d battle of Camden.

**Ho'boken,** N.J., port of entry, r.r. and industrial center opposite New York City on Hudson R.; pop. 68,166; terminus of several important steamship lines and coal-shipping point; Stevens Institute of Technology; **2457;** water front, *picture*, **2460.**

**Hobson, Richmond Pearson** (born 1870), Amer. naval hero, b. Greensboro, Ala.; sinks collier *Merrimac*, **3306,** *picture*, **3307.**

**Hobson's choice.** Expression used to signify "this or nothing"; arose from fact that Thomas Hobson (1544–1630), a stable-keeper of Cambridge, England, insisted upon each customer's accepting for hire the horse nearest the door.

**Hochelaga** (*hō-shĕ-lä'gȧ*), Canada, early Indian village at mouth of Ottawa R., **652.**

**Hochkirch** (*hōĸ'kĭrĸ*), Germany. Village 35 mi. n.e. of Dresden where Austrians defeated Prussians under Frederick the Great 1758 (Seven Years' War).

**Hochstädt** (*hōĸ'shtĕt*), Germany. Town in Bavaria on Danube R. 60 mi. n.w. of Munich; battle of Blenheim 1704.

**Hock'ey, 1669–70;** ice, *picture*, **3755.**

**"Hoc signo vince"** ("In this sign conquer"), **870.**

**Hodeida** (*hō-dā'ĭ-dä*). Fortified seaport of Yemen, Arabia, on Red Sea; pop. 40,000; center of coffee trade.

**Ho'der,** in Norse myth., blind god who slew Balder, **306.**

**Hodmezö-Vasarhely** (*hōd'mā-zû-vä-sär-hä'lē*). Agricultural town in s.e. Hungary, 15 mi. n.e. of Szeged; pop. 63,000.

**Hoe, Richard March** (1812–86), Amer. manufacturer and inventor, b. New York; with his brothers Peter S. and Robert developed the web perfecting press which revolutionized newspaper printing; **2916.**

**Hoener** (*hû'nēr*), in Norse myth., god who with Odin and Loder created first men, Ask and Embla, from trees in Midgard; from Odin they obtained life, from Hoener, mind, and from Loder, blood; and Rodmar, **2504.**

**Hof'burg,** palace in Vienna, **3641.**

**Ho'fer, Andreas** (1767–1810), Tyrolese patriot and popular hero, leader of insurrection against Bavaria; betrayed, court-martialed, and shot; **3574.**

**Hoffman, Charles Fenno** (1806–84). Amer. poet and novelist; wrote several novels of western life, but remembered only for his songs (especially 'Rosalie Clare' and 'Monterey') which were deservedly popular.

**'Hoffman, Tales of',** opera, **2584.**

**Hoffmann** (*hŏf'mäun*), **August Heinrich** (1798–1874), called Hoffmann von Fallersleben. Ger. poet and philologist; wrote verses to 'Deutschland über Alles'.

**Hoffmann, Ernst Theodor Amadeus** (1776–1822). Ger. novelist, leader in romantic movement; dealt by preference with the marvelous and grotesque, yet mixed shrewd satire and wit with products of his eratic imagination; 'The Devil's Elixir' is most famous novel.

**Hofmann, August Wilhelm von** (1818–92), Ger. chemist and teacher whose work helped found Ger. coal-tar industry; discovered benzol in coal-tar, **384.**

**Hofmann, Heinrich** (1824–1902), Ger. historical painter; popular for ideal conceptions of Biblical events; 'Christ in the Temple', *picture*, **1887.**

**Hofmann, Josef** (born 1877). Polish pianist; an infant prodigy at six, made a successful concert tour of Europe at nine; in his mature years, considered both as an interpreter and as a technician, had few rivals.

**Hofmannsthal** (*hōf'mäns-täl*), **Hugo von** (born 1874). Austrian neo-romantic dramatist and poet, whose principle is that art and life are far apart; his characters, therefore, often do not approach real life; 'The Death of Titian' one of his best plays; 'Elektra' and 'The Rose Cavalier' used as libretti for operas by Richard Strauss.

**Hog,** a domesticated mammal of the swine family, **1670–1;** alfalfa as feed, **88,** *picture*, **89;** bristles, **516;** corn the staple food in U.S., **888;** eats rattlesnakes, **2978;** effect of breeding, *picture*, **49;** inheritance of colors, **1642;** lard, **1227, 2577;** length of life, **126;** in meat packing, **2180–5;** trichinae, **3814.**

**Ho'garth, William** (1697–1764), Eng. painter and engraver, called the "Molière of painting," **2631.**

**Hog cholera,** an infectious bacterial disease afflicting swine; causes diphtheritic condition of intestine; **1671.**

**Hogg** (*hŏg*), **James** (1770–1835). The "Ettrick Shepherd," Scotch peasant poet ('Scottish Pastorals'; 'The Mountain Bard'; 'The Queen's Wake').

**Hog Island,** great U.S. shipyard near Philadelphia, **3214, 3216,** *picture*, **3210.**

**Hog-nosed snake, 3261.**

**Hogshead,** a unit of measure, **3715.**

**Hogue** (*ōg*), **La, battle of** (1692), **1861.**

**Hohenfriedeberg** (*hō-ĕn-frē'dē-bĕrĸ*), Germany. Small town in Silesia, 36 mi. s.w. of Breslau; victory of Frederick the Great over Austrians and Saxons 1745 in War of Austrian Succession.

**Hohenlinden** (*hō-ĕn-lĭn'dĕn*), Germany. Village in Upper Bavaria, 19 mi. e. of Munich; Fr. victory over Austrians in 1800.

**Hohenstaufen** (*hō'ĕn-shtou-fĕn*), a noble Ger. family of Middle Ages, **1672, 1447;** and Ghibellines, **1546;** overthrown, **1358–9.** For list of Hohenstaufen emperors *see in Index* **Holy Roman Empire.**

**Hohenzollern** (*hō'ĕn-tsōl-ĕrn*), a noble Ger. family, **1672, 2928–9;** downfall, **3738.** For list of Hohenzollern kings *see in Index* **Prussia.**

**Hohenzollern,** a province of Prussia; 441 sq. mi.; pop. 71,000; **1672, 2928.**

**Hohe Tauern** (*hō'ĕ tou'ĕrn*), a division of the Eastern Alps, **3573.** Name also applied to a particular summit (8080 ft.) lying s. of Hof-Gastein.

**Hokkaido** (*hōk-kī'dō*). Same as **Hokushu.**

**Hokusai** (*hō'ku-sä-ē*) (1760–1849). Japanese artist of popular school; on his deathbed at 89 he mourned that he had not lived long enough to become a great artist; strongly influenced modern art; remarkable for his industry; 30,000 drawings known to be his.

**Hokushu** (*hō'kų-shų*), also **Hokkaido** or **Yezo,** most northern large isl. of Japan; 30,340 sq. mi.; *map*, **1864;** coal, **1867.**

**Holbein** (*hōl'bīn*), **Hans, the Elder** (1460–1524). Ger. painter, best known for 'The Basilica of St. Paul' and a 'Passion' in 11 scenes; later work shows Ital. influence grafted on Flemish of his youth.

**Holbein, Hans, the Younger** (1497–1543), Ger. painter, son of Hans the Elder, **1672–3, 2630;** portrait of Erasmus, *picture*, **2636.**

**Holberg** (*hōl'bĕrĸ*), **Ludvig, Baron** 1684–1754), Norwegian-Danish dramatist, historian, and philosopher; made Danish a literary language; had vast influence over his Countrymen ('Subterranean Journey of Niels Klim'; 'Letters'; 'Comedies'); **3134.**

**Holborn** (*hō'bôrn*), England. Metropolitan borough in cent. part of London; pop. 43,000; contains Lincoln's Inn and Gray's Inn.

**Holding company,** defined, **3546.**

**Holidays and festivals, 1673;** All Fools' Day, **162;** Arbor Day, **173;** Chinese, **742, 751, 2478;** Christmas, **758–62;** church, **3103, 1070, 1033, 1566;** Easter, **1070;** Flag Day, **1288;** French, **1368;** Greek, **1031–2, 991, 1012;** Guy Fawkes' Day, **1228;** Hallowe'en, **1566;** India, **162, 1751;** Japanese, **1872, 2478;** Jewish, **1180, 2479, 2691;** Mardi Gras, **1070, 2470,** *picture*, **2071;** May Day, **2175;** Memorial Day, **2196;** New Year's Day, **2478–9;** Roman, **3129, 1012;** Saint Patrick's Day, **2694;** St. Valentine's Day, **3111;** Swedish Midsummer's Day, **3401, 3357;** Thanksgiving, **3482.**

**Holinshed** (*hŏl'ĭnz-hĕd* or *hŏl'ĭn-shĕd*) or **Hollingshead, Raphael** (d. 1580), Eng. chronicler, compiler of 'Chronicles of England, Scotland, and Ireland' which contains large mass of information and shows that its compiler was industrious, but is now valued chiefly because it was a source-book for the Elizabethan dramatists; Shakespeare's debt to, **3190.**

**Hol'land, John Philip** (1844–1914), Amer. inventor, b. Ireland; designs type of submarine, **3378.**

**Holland, Josiah Gilbert** (1819–81). Amer. editor and author, b. Belchertown, Mass., ('Bitterswcet'; 'Sevenoaks').

**Holland,** Mich. Port and mfg. city at head of Black L. 25 mi. s.w. of Grand Rapids; pop. 12,183; furniture, furnaces, chemicals, shoes, tanned leather, medicines, beet-sugar; Hope College.

**Holland, North** and **South,** chief provinces of the Netherlands, **1673.** *See also in Index* **Netherlands.**

**Hol'les, Denzil, Baron Holles** (1599–1680). Eng. parliamentary leader active in opposing Stuart tyranny; imprisoned 1629 for anticrown demonstration in the Commons, he denied court's jurisdiction over acts committed in Parliament; helped Pym draw up Grand Remonstrance; participated in Civil War but opposed Cromwell and army policy.

**Holly,** an evergreen tree or shrub, **1673;** botanical classification, **3533;** leaves, *picture,* **2826;** S. Amer. drink from, **3451,** *picture,* **3286.**

**Hol'lyhock,** a garden plant of the mallow family, **1673–4.**

**Hollywood,** Calif., suburb of Los Angeles; center for motion picture industry; view in, *picture,* **2062.**

**Hollywood Cemetery,** Richmond, Va., **3019.**

**Holmenkollen,** hill near Christiania, Norway, **2530.**

**Holmes, Oliver Wendell** (1809–94), Amer. poet and essayist, **1674, 113, 1178;** and anesthetics, **124;** invents open stereoscope, **3354;** 'Old Ironsides', quoted, **2423;** quoted on Emerson, **1142.**

**Holmes, Oliver Wendell** (born 1841). Amer. jurist, b. Boston; son of preceding; associate justice U.S. Supreme Court since 1902; exceptional combination of literary ability and statesmanlike insight with legal learning.

**Holmes, Sherlock.** In Conan Doyle's detective stories, marvelous amateur detective who unravels the most baffling mysteries.

**Holocan'thus, scarlet,** a fish, *picture,* **1271.**

**Holocene** (*hŏl'ō-sēn*), in geology, the epoch of recent time, including the present, *picture,* **1419.**

**Holofernes** (*hŏl-ō-fēr'nēz*). Assyrian general slain by Judith; story told in apocryphal book of Judith.

**Holokus,** Hawaiian garments, **1602.**

**Holothu'rian,** or sea-cucumber, a worm-shaped marine animal related to starfish, **3165.**

**Holothuroidea** (*hŏl-ō-thū-roid'ē-ȧ*), a class of echinoderm animals including sea-cucumbers and sea slugs, **3945.**

**Holstein** (*hōl'stīn*). Former duchy of Denmark; since 1866 s. part of Schleswig-Holstein. *See in Index* **Schleswig-Holstein.**

**Holstein,** a breed of dairy cattle, **950,** *pictures,* **952, 1732, 2263.**

**Holston River,** branch of Tennessee R.; rises in s.w. Va. and flows 200 mi. s.w. into e. Tenn., **3466, 3648.**

**Holy Alliance,** league of European powers, **85, 1196.**

**Holy Cross College,** at Worcester, Mass.; men; Rom. Cath.; founded 1843; liberal arts; **2170.**

**Holy Cross, Mount of the,** peak of the Saguache Range in Colo., **842, 3036.**

**Holy Grail.** *See in Index* **Grail, Holy.**

**Holyhead,** Welsh port on Holy Isl., just w. of Anglesey, N. Wales; pop. 10,000; **3664.**

**Holy Land,** Palestine, **2643–7.**

**Holy League,** formed 1511 by pope, Venice, and Ferdinand II of Spain to drive France from Italy; later joined by Emperor Maximilian and Henry VIII; **1902.**

**Holy League** (1576). *See in Index* **Catholic League.**

**Hol'yoke,** Mass., city 8 mi. n. of Springfield on Connecticut R., noted for its paper mills; pop. 60,203; textiles, thread, machinery; **2165.**

**Holyoke, Mt.,** a steep hill 6 mi. n. of Holyoke; famous for view of Connecticut valley from its summit; 955 ft. high; *map,* **2166.**

**Holy Roman Empire, 1674–5, 1447–8, 1195;** Charlemagne founds, **688–90;** Saxon and Franconian emperors, **2606, 1632;** Otto I revives, **2606, 1842, 1195;** investiture conflict, **1541, 1632–3;** Hohenstaufens renew conflict with pope, **1672, 1546, 1358, 1633;** and Innocent III, **1780;** Golden Bull and electoral college, **1675, 691, 1447, 1357;** under the Hapsburgs, **1576, 1578, 690–1;** Thirty Years' War, effect, **3489, 1195;** dissolved, **1448, 2395.** *See also in Index* **Austria; Germany;** and emperors by name.

RULERS OF THE HOLY ROMAN EMPIRE

800-814 Charlemagne
814-840 Louis the Pious
840-911 Later Carolingians
[911-918 Conrad I]

SAXON LINE

919-936 Henry I, the Fowler
936-973 Otto I, the Great
973-983 Otto II
983-1002 Otto III
1002-24 Henry II

FRANCONIAN LINE

1024-39 Conrad II
1039-56 Henry III
1056-1106 Henry IV
1106-25 Henry V
[1125-37 Lothair II of Saxony]

HOHENSTAUFEN LINE

1138-52 Conrad III
1152-90 Frederick I (Barbarossa)
1190-97 Henry VI
1198-1208 Philip of Swabia } rival
1198-1214 Otto IV } claimants
1215-50 Frederick II
1250-54 Conrad IV
[1256-73 Great Interregnum]

RULERS FROM VARIOUS HOUSES

1273-91 Rudolph of Hapsburg
1292-98 Adolf of Nassau
1298-1308 Albert of Austria
1308-13 Henry VII of Luxemburg
1314-47 Louis IV of Bavaria } rival
1314-30 Frederick the Fair } claimants

LUXEMBURG LINE

1347-78 Charles IV
1378-1400 Wenceslaus
[1400-1410 Rupert of the Palatinate]
1410-37 Sigismund

HAPSBURG LINE

1438-39 Albert II
1440-93 Frederick III
1493-1519 Maximilian I
1519-56 Charles V
1556-64 Ferdinand I
1564-76 Maximilian II
1576-1612 Rudolph II
1612-19 Matthias
1619-37 Ferdinand II
1637-57 Ferdinand III
1658-1705 Leopold I
1705-11 Joseph I
1711-40 Charles VI
[1742-45 Charles VII of Bavaria]
1745-65 Francis I
1765-90 Joseph II
1790-92 Leopold II
1792-1806 Francis II (after 1806 reigned as Francis I of Austria)
[1806 Title of Holy Roman Emperor abolished.]

EMPERORS OF AUSTRIA

1806-35 Francis I
1835-48 Ferdinand II
1848-1916 Francis Joseph
1916-18 Charles

**Holyrood Palace,** Edinburgh, Scotland, **1080.**

**Holy Saturday, 1070.**

**Holy Sepulcher, Church of the,** Jerusalem, **1885–6.**

**Holy Thursday, 1070.** Also called Maundy Thursday, in commemoration of the washing of the disciples' feet by Jesus.

**Holy Week, 1070.**

**Hom'age,** in feudalism, **1236.**

**Home economics, 1675,** *Study Outline,* **3995;** baby care, **291–4;** cleanliness and sanitation, **1715, 1312–3;** cloth and clothing, **804, 805–9, 897–901;** cooking, **875–8;** electric devices, **1114, 1116,** *pictures,* **1115;** embroidery, **1140;** fire prevention, **1260–2;** first aid, **1266–70;** food and food values, **1320–2, 2926, 2238–9, 3651–2;** furniture, **1383–8;** heating and ventilation, **1621–4, 3368;** instruction in, **3654, 3655, 3656;** laundry, **1969;** lighting systems, **1958–9, 1123–4, 1406–7;** paints and varnishes, **2642–3;** plumbing and sewerage, **2840, 3183;** rugs and carpets, **3077–80;** sewing, **3183–6;** soap, **3263–7;** stoves and fireplaces, **3368;** wall paper, **3665–7.** *See also in Index* **Cooking; Food; Food values; Sewing;** etc.

**Homel'** or **Gomel',** Russia. Mfg. and r.r. center and river port on branch of Dnieper R., 350 mi. s.w. of Moscow; pop. 105,000.

**Homeop'athy,** a system of medicine founded by Hahnemann; guiding principle is that a drug causing certain symptoms in normal persons is the proper remedy for a disease showing the same symptoms ("like cures like"); **2193.**

**Ho'mer,** anc. Gk. poet, to whom is ascribed authorship of 'Iliad' and 'Odyssey', **1675–6, 1535;** pictures life of early Greeks, **1520;** vocabulary, **1162.** —*Stories from:* Achilles, **8, 9;** Adventures of the Great-Hearted Odysseus, **2562–6;** Aphrodite in the Trojan War, **155;** Athena and Diomedes, **248;** Death of Hector, **1626–7;** Odysseus and Circe, **767–8;** How Odysseus and His Men Outwitted the Cyclops, **944–5;** Proteus, **2926;** Trojan War, **3542–3.**

**Homer, Louise** (born 1872). Amer. dramatic contralto singer, b. Pittsburgh, Pa.; her voice is remarkably even in quality over a great compass; notable rôles, Amneris in 'Aïda', Laura in 'La Gioconda', Ortrud in 'Lohengrin'.

**Homer, Winslow** (1836–1910), considered most typically national of all Amer. painters; pictures the ocean and fisher folk with uncompromising verity; 'The Maine Coast' (Metropolitan Museum) and 'On a Lee Shore' (Providence) considered his masterpieces; **2634.**

**'Homer, A Reading from',** by Alma-Tadema, *picture,* **3542.**

**"Homer of Rome," 1967.**

**"Homer of the insect," 1217.**

**Homer pigeon.** Same as **Homing or carrier pigeon.**

**Home Rule,** for Ireland, **1811;** Belfast opposes, **371;** Gladstone's measures, **1468;** O'Connell, **2559;** Parnell, **2689–90.**

**Homestake Mine,** large gold mine in w.-cent. S.D., **3296, 3297,** *picture,* **3295.**

**Homestead,** Pa. Important steel-mfg. borough 5 mi. s.e. of Pittsburgh; pop. 20,452; scene of notable strike in 1892.

**Homestead laws,** in U.S., **1896, 1960;** in Canada, **1960.**

**Homing, homer,** or **carrier pigeon, 2804, 130,** *picture,* **2805;** story, 'The Pigeon that Won a War Medal', **2806.**

**Hominidae** (*hō-mĭn'ĭ-dē*), mankind considered as a family in zoölogical classification, **2134, 3952.**

**Hom'iny,** or hulled corn, **890.**

**Homo** (*hō'mō*), generic name for man, **2133, 2134.**

**Honan'.** Inland province of e.-cent. China; 67,940 sq. mi.; pop. 22,500,000; cap. Kaifeng; cereals, cotton, tobacco, indigo, hemp, minerals.

**Hondo** (*hŏn'dō*). Same as **Honshu.**

**Honduras** (*hŏn-dọ̄'rȧs*), republic of Cent. Amer.; 44,275 sq. mi.; pop. 640,000; **1676, 679–82,** *maps,* **2514–5;** mahogany, **2124.**

**Honduras, British.** *See in Index* **British Honduras.**
**Honduras, Gulf of,** inlet of Caribbean Sea on e. coast of Cent. Amer.; *map,* **680.**
**'Honesty',** a Little Talk by Arthur Mee, **1677;** in child training, **735.**
**Honey, 360, 362,** *pictures,* **361;** buckwheat flavored, **524;** clover best source, **809, 810;** contains glucose, **1475;** used for sweetening before sugar, **3385.**
**Honey-bee.** *See in Index* **Bee.**
**Honeycomb,** waxy many-celled structure made by bees for holding honey, **360, 359,** *pictures,* **361.**
**Honey-dew melon, 2196.**
**Honey locust,** a tree related to the bean family, **2045;** flowers, **3535;** name applied to mesquite, **2201;** used in hedges, **1627.**
**Honeysuckle,** various shrubs bearing fragrant trumpet-shaped flowers, **1678;** name incorrectly applied to columbine, **846.**
**Honeysuckle, wild,** or azalea, **288, 1678, 3012.**
**Hongkong,** China, isl. city and Brit. colony; pop. 563,000; **1678–9, 746.**
**"Honi soit qui mal y pense," 979.**
**Hon'iton pillow lace, 1950.**
**Honolulu** (*hŏn-ō-lụ'lụ*), cap. of Hawaiian Isls.; pop. 84,000; **1602,** *map,* **1604;** Pacific cable, **561;** street scene, *picture,* **1603.**
**Honor, decorations of, 976–9, 3579;** orders of knighthood, **979, 1935.**
**Hono'rius, Flavius,** Rom. emperor of the west; son of Theodosius; invasion of Goths, **73;** suppresses gladiatorial contests, **1466.**
**Honshu** (*hŏn-shụ'*) or **Hondo,** largest isl. of Japanese Empire; 86,953 sq. mi.; **1863,** *map,* **1864.**
**Hood, John Bell** (1831–79), Confederate Civil War general, b. Owingsville, Ky.; commanded divisions at Gettysburg and Chickamauga; commander of Army of the Tennessee, succeeding Johnston; decisively defeated (1864) at Nashville; **3490, 2398.**
**Hood, Samuel, Viscount** (1724–1816). Eng. naval commander-in-chief in America 1767–71; distinguished in various battles 1780–83 with Fr. fleet under De Grasse; commanded in Mediterranean 1793; great tactician.
**Hood, Thomas** (1798–1845). Eng. poet and humorist whose enduring fame rests on serious work ('The Song of the Shirt'; 'Miss Kilmansegg').
**Hood, Mt.,** in Cascade Range of n. Oregon, 11,225 ft., 45 mi. s.e. of Portland, **2885,** *picture,* **2597;** why its cone is steep, **1972.**
**Hoo'doo,** a person or thing whose presence causes bad luck; derived from voodoo, **2118.**
**Hoof,** horny sheath encasing toes of many animals; corresponds to finger-nail or toe-nail of man; **1571, 1683, 3246.**
**Hoo'ka,** pipe used in Orient, *picture,* **2735.**
**Hooker, Joseph** (1814–79), "Fighting Joe," Amer. Civil War general; commanded Army of Potomac (1863) succeeding Burnside, **1361;** lost battle of Chancellorsville, **1984;** relieved by Meade, **1453;** commanded victorious Army of Cumberland at "Battle above the Clouds," **701.**
**Hooker, Sir Joseph Dalton** (1817–1911), eminent Eng. surgeon and naturalist; made important additions to botanical knowledge; expeditions to Antarctic regions, Australia, the Himalayas, and Syria; wrote 'Genera Plantorum'; friend of Darwin, **964.**
**Hooker, Richard** (1553–1600). Eng. author, wrote 'Laws of Ecclesiastical Polity', a masterly exposition of philosophical and political principles; it has been called the earliest Eng. prose work "with enough of the preserving salt of excellence to adapt it to the mental palate of modern readers."
**Hooker, Thomas** (1586–1647), Puritan clergyman, b. England; chief founder of Conn. colony; helped form (1643) New England Confederation; **867.**
**Hook of Holland,** point of land at mouth of Maas (Meuse) R., 18 mi. from Rotterdam, **2440.**
**Hooks and eyes, 3185.**
**Hookworm,** widespread intestinal parasite, **1679;** prevalent in Cent. Amer., **679;** Rockefeller Foundation campaign, **3034.**
**Hooper, John** (1495?–1555). Eng. martyr, bishop, and religious reformer; burned as heretic in reign of Mary.
**Hoo'poe.** Any bird of the genus *Upupa,* a small group native to warmer regions of the Old World; the common European hoopoe is about the size of a bluejay, has plumage of black, white, and buff mixed, a long pointed bill, and a large erectile crest of two parallel rows of feathers.
**Hoop skirt, 900.**
**Hoosac Mountain,** a spur of the Green Mts. in n.w. Massachusetts (Spruce Hill, 2588 ft.), *map,* **2166.**
**Hoosac** (*họ'săk*) **tunnel,** in n.w. Mass., through Hoosac Mt. to North Adams, **3552.**
**"Hoosier poet," 3020.**
**Hoosier State, 1757.**
**Hoover, Herbert Clark** (born 1874), Amer. mining engineer, Federal food administrator during World War, sec. of commerce under Pres. Harding, **1679–80, 3802.**
**Hope, Anthony.** Pen name of Sir Anthony Hope Hawkins (born 1863), Eng. novelist; 'The Prisoner of Zenda' and 'Rubert of Hentzau' set fashion for romantic comedies involving noblemen of fictitious principalities; later novels are more serious in tone and deal with social and ethical problems of modern life.
**Hope College.** At Holland, Mich.; co-ed.; Dutch Reformed church; founded 1866; classics, philosophy, natural science, modern languages, English, mathematics.
**Hopewell,** Va., **3650.**
**Hopis** (*hō'pĭz*) or **Mokis,** tribe of Pueblo Indians in cent. Ariz., **1767, 2933, 202, 1318;** village, *pictures,* **1766, 1769.**
**Hopkins, Johns** (1795–1873). Amer. financier and philanthropist, b. on a farm in Anne Arundel County, Md.; from humble beginnings became a great merchant and the leading financial man in Baltimore; founded Johns Hopkins Univ., Johns Hopkins Hospital, and an asylum for negro orphans in Baltimore.
**Hopkins, Mark** (1802–87), Amer. educator and author, b. Stockbridge, Mass.; pres. of Williams College from 1836 to 1872; **1398.**
**Hopkins, Oceanus, 2178.**
**Hopkinson, Francis** (1737–91), Amer. jurist, one of signers of Declaration of Independence; admiralty judge of Pa. 1779–89, then U.S. district judge; probably designed Amer. flag, **1288.**
**Hopkinson, Joseph** (1770–1842), Amer. jurist, son of Francis Hopkinson; wrote 'Hail Columbia', **2405.**
**Hoplite** (*hŏp'līt*), heavy-armed Gk. warrior, *picture,* **215.**
**Hopper, (William) De Wolf** (born 1850). Amer. actor, starred in Gilbert and Sullivan's operas, especially 'The Mikado', 'Patience', 'Pinafore'; recited 'Casey at the Bat'.
**Hoppner, John** (1758–1810). Eng. portrait painter, rival of Lawrence ('Nelson'; 'Countess of Oxford').
**Hops,** climbing herbs whose fruits are used in brewing, **1680.**
**Ho'quiam,** Wash. Port on Grays Harbor, 80 mi. s.w. of Tacoma; pop. 10,058; lumbering and fishing industries and shipping interests.
**Hor'ace** (Quintus Horatius Flaccus) (68–8 B.C.), Latin lyric poet, **1967,** *picture,* **3041.**
**Horae** (*hō'rē*) or **Hours,** maidens in Gk. myth., **155.**
**Horatii** (*hō-rā'shĭ-ī*), legendary Rom. heroes, **3041.**
**Horatio** (*hō-rā'shĭ-ō*). In Shakespeare's 'Hamlet', devoted friend of Hamlet.
**Hora'tius Cocles** (*kō'klēz*), legendary Rom. hero, **3494–5.**
**Ho'reb, Mt.** Same as **Sinai.**
**Hore'hound.** A genus of plants of the mint family; the common or white horehound (*Marrubium vulgare*), found in most regions of Europe and in the U.S., is a bushy perennial 1 to 1½ ft. high with roundish wrinkled leaves covered with white down and whorls of white flowers; it is used as an infusion with sugar for coughs or as a candy.
**Hormones** (*hôr'mō-nēz*), bodily secretions supposed to excite various processes such as growth, **1469–70.**
**Horn** or **Hoorn, Philip de Montmorency, Count** (1518–68), Flemish patriot, **520.**
**Horn,** of animals, **1680;** developed from epidermis, **3246;** hollow in bovine animals, **663;** of moose, **2325;** permanent in antelopes, **146;** renewed in deer, **979–81;** yields gelatin and glue, **1409, 1475–6.**
**Horn, Cape,** most southerly point of S. Amer., on isl. of the Fuegian Archipelago, **3285.**
**Horn, musical, 1680–1, 2383, 2591,** *pictures,* **2382;** sacred ram's horn, *picture,* **1890.**
**Hor'naday, William Temple** (born 1854). Amer. zoölogist, b. Plainsville, Ohio; director of New York Zoölogical Park; pres. of Wild Life Protective Association; introduced legislation to protect and increase wild life.
**Hornbeam.** A small tree of the birch family with very hard tough wood and smooth gray bark.
**Hornbill,** a tropical bird, **1681;** partnership with rhinoceros, **3006.**
**Hornblende.** A black or greenish-black mineral containing chiefly calcium, magnesia, and alumina; found in crystals and granular masses; a common constituent of granite and other igneous rocks.
**Horne, Henry Sinclair Horne,** first **Baron** (born 1861). Brit. general; went to Near East with Kitchener in 1914; 1916 commander of 1st Army; rank of full general 1919, and made baron.
**Horne, Sir Robert Stevenson** (born 1871). Brit. politician; 1919 minister of labor; presided at National Industrial Conference 1919; pres. of Board of Trade 1920; chancellor of the exchequer 1921.
**Horned lark, 1963,** *picture,* **420;** courtship flights, **405;** care of young, **408.**
**Horned owl, 2607,** *pictures,* **2607, 403.**
**Horned rattlesnake, 2978.**
**Horned toad,** a lizard, **2037–8, 3507;** protective coloration, **2924.**
**Horned viper, 3647.**
**Hornell',** N.Y. Mfg. city and agricultural trade center on Canisted R., 58 mi. s. of Rochester; pop. 15,025; furniture, machinery, silk.
**Hor'net,** a social wasp, **1681, 3690, 3693;** nest, *picture,* **2667.**
**'Hornet',** Lawrence's ship, **1973.**

**Hornet-moth,** metamorphosis **of, 1790–1.**
**Hornpipe,** a dance, **1319.**
**Hor'oscope,** the position of the heavenly bodies at time of a person's birth, **3840.**
**Horse, 1682–5;** armor, *pictures,* **215;** classified as odd-toed ungulate, **3434;** cordovan leather, **1977;** earliest uses, **3524, 297, 1669, 1104;** effect of breeding, *picture,* **49;** evolution, **1209, 1322,** *picture,* **1682,** *diagram,* **128;** foot, *picture,* **1323;** French breeds, **1346;** "homing" instinct, **130;** hoof a modified fingernail, **1571;** inheritance of colors, **1642;** Kentucky breeding, **1917–8;** related to rhinoceros, **1336;** story, 'The Luck of the Calico Horse', **1686–7.**
**Horse ant,** a wingless wasp, **3693.**
**Horse-chestnut,** Eng. buckeye tree or its fruit **524;** botanical classification, **3533;** flowers, **3535;** leaves, *pictures,* **1980, 1981.**
**Horse family** or *Equidae,* a family of one-toed, hoofed animals with peculiarly ridged and hollowed teeth, **1685;** includes horse, **1682–7,** ass, **235–6,** zebra, **3838.**
**Horse-fly** or **gadfly.** A short-bodied fly with horny-pointed proboscis adapted for bloodsucking.
**Horsehair,** uses of, **1560.**
**Horsehair worm, 3814.**
**Horse latitudes,** a zone of light winds between the "trade wind" and "prevailing westerly" zones, **3750,** *picture,* **3751.**
**Horse leech, 1985.**
**Horse mackerel** or **tunny, 3552–3.**
**Horse nettle, 2509.**
**Hor'sens,** Denmark, scaport on Fiord of Horsens, 32 mi. s.w. of Aarhus; pop. 25,000; iron products, ships, woodenware; exports butter and bacon; **996.**
**Horse of Troy,** story of, **3543–4.**
**Horse-power,** defined, **3349;** equivalent in kilowatts, **1052, 1116.**
**Horse-racing, 1685.**
**Horseradish, 554.**
**Horseshoe Bend,** in Tallapoosa R., about 40 mi. n.e. of Montgomery, Ala.; where Jackson defeated Creek Indians (1814), **1856, 1772.**
**Horse-shoe** or **king crab,** a crablike creature of uncertain zoölogical relationships, **3945,** *picture,* **913;** possibly descended from trilobites, **1336.**
**Horseshoe Fall,** the Canadian portion of Niagara Falls, **2502.**
**Horses of St. Mark's,** a famous bronze group adorning St. Mark's Cathedral in Venice, **1852, 3624.**
**Horsetail rushes, 3083, 1234.**
**Hor'ta.** A city of the Azores, cap. of Fayal.
**Horten'sian law** (*lex Hortensia*), in Rom. history, **3044.**
**Horthy de Nagybanya, Nikolaus** (born 1868). Hungarian admiral; elected regent of Hungary 1920; suppressed attempts of former King Charles to regain throne.
**Hor'ticulture.** *See in Index* **Gardens and gardening.**
**Horton,** England, Milton's home, **2242.**
**Horus** (*hō'rŭs*), Egypt. sun-god, **1832, 2602.**
**Hosain.** *See in Index* **Hasan.**
**Hosea** (*hō-zē'ä*) (8th cent. B.C.), Hebrew minor prophet; wrote 28th book of Old Testament, **2922.**
**Ho'siery,** machines for knitting, **1935–7.**
**Hos'mer, Harriet** (1830–1908). Amer. sculptor, b. Watertown, Mass.; a classicist; invented several technical processes in connection with her art ('Puck'; 'The Sleeping Faun'; 'The Waking Faun').
**Hos'pitalers** (Order of the Hospital of St. John of Jerusalem), **932, 2131, 3011.**
**Hospitals, 1687–8;** in Crusades, **932;** oldest in U.S., **2761;** Red Cross, **2984;** training of nurses, **2544;** work of Florence Nightingale, **2509.**
**Host,** in biology, **2677.**
**Hosti'lius, Tullus,** Rom. king, **3041.**
**Hotbed, 1394,** *picture,* **1396.**
**Hotch'kiss, Benjamin B.** (1826–85), Amer. inventor of Hotchkiss machine gun, **2097.**
**Hôtel des Invalides** (*ō-tĕl' dā zăn-vä-lēd'*), Paris, **2684.**
**Hôtel de Ville** (*dē vēl*), Brussels, **520.**
**Hot-flame welding, 3716.**
**Hot Springs,** Ark., noted health resort in a valley of the Ozark Mts.; pop. 11,695; Army and Navy General Hospital; **207.**
**Hot springs, 3331.**
**Hotspur.** *See in Index* **Percy, Sir Henry.**
**Hot Sulphur Springs,** Colo., town; pop. 123; **845.**
**Hot'tentots,** race of S. Africa now confined to w. Cape of Good Hope and adjoining territory; **36, 37, 3280.**
**Hot-water heating, 1622.**
**Hot-wire ammeter, 1114,** *picture,* **1116.**
**Houdin** (*ų-dăn'*), **Robert** (1805–71), Fr. conjurer and prestidigitator, **2121.**
**Houdon** (*ų-dôn'*), **Jean Antoine** (1741–1828), Fr. sculptor, **3158;** statue of Washington, **3019,** *picture,* **3161;** copy in London, *picture,* **2055.**
**Houghton** (*hô'tŏn*), **Stanley** (1881–1913). Eng. critic and dramatist, a leader in realistic movement ('Hindle Wakes').
**Houghton,** Mich., village opposite Hancock on L. Portage, connected with L. Superior by canal; pop. 4466; shipping point for L. Superior copper region; **1513, 2226, 2227.**
**Hounds,** hunting dogs, **1021–2, 1023.**
**Hour,** why divided into 60 minutes, **295.**
**Hour-glass,** or sand-glass, **797,** *picture,* **799.**
**Houris** (*hų'rĭz*). In Mohammedan religion, beautiful maidens who minister to the faithful in Paradise.
**Hours,** maidens in Gk. myth., **155.**
**Housaton'ic,** river rising in Berkshires in w. Mass.; flows s. 155 mi. through Conn. to Long Island Sound; **866.**
**House,** (Col.) **Edward Mandell** (born 1858), Amer. political leader, b. Houston, Tex.; confidential agent of Pres. Wilson to European govts. during World War; member Amer. Peace Commission 1919; **3747.**
**House-boats,** Chinese life on, **751, 639,** *picture,* **745.**
**House cricket, 921.**
**Housefly, 1312–3;** eggs, *picture,* **1091.**
**House of Commons.** *See in Index* **Commons, House of.**
**House of Lords.** *See in Index* **Lords, House of.**
**House of Representatives.** *See in Index* **Representatives, House of.**
**'House of the Seven Gables',** romance by Hawthorne, **1607.**
**Houses:** Anamese, **1777;** cliff dwellings, **793–4, 844, 2933,** *pictures,* **793, 844, 203, 205;** Elizabethan manor houses, **188;** Eskimo igloos, **1175;** Greek (anc.), **1522, 1524,** *picture,* **1521;** heating and ventilation, **1621–4, 1715–6;** Japanese, **3511, 1870;** lake dwellings, **1957, 771–2,** *picture,* **773;** Magyar, **1702,** *picture,* **1703;** Malay, **2130;** medieval castle, **654–7;** New Guinea tree dwellings, *picture,* **2452;** N. Amer. Indian, **1770, 2933,** *pictures,* **1769, 1770;** Polish peasant, **2857;** Roman (anc.), **2876–7, 1533;** sanitation, **1715–6;** S. Amer., **3286.** For pictures of houses in all lands, *see* Study Outline, **3998.**
**Houses of Parliament.** *See in Index* **Parliament, Houses of.**
**House sparrow, 3308;** how he gets his black throat, **410.**
**House-wren, 3815,** *picture,* **419.**
**Hous'man, Alfred Edward** (born 1859), Eng. poet and scholar; professor of Latin, Cambridge; best known work 'A Shropshire Lad'—lyric sequence of exquisite sensitiveness to life's beauty and cruelty; quoted, **2850.**
**Housman, Laurence** (born 1865), Eng. writer and illustrator, brother of A. E. Housman; distinguished by phantasy and mysticism ('Spikenard'; 'Prunella'—in collaboration with Granville Barker); **1167.**
**Houston** (*hųs'tŏn*), **David Franklin** (born 1866). Sometime pres. of U. of Texas; chancellor of Washington Univ. 1908–16; sec. of agriculture under Wilson 1913–20; sec. of treasury 1920–21.
**Houston, Sam** (1793–1863), Amer. soldier and statesman, pres. of republic of Texas, **1688, 261, 3478.**
**Houston,** Tex., important seaport and r.r. center of s. Tex.; pop. 138,276; **1688, 3477.**
**Houynhnms** (*hų-in'mz*), in 'Gulliver's Travels', **3409–10.**
**Hov'as,** tribe of Madagascar, **2106.**
**Hover-fly, 1790, 1791.**
**Hovey, Richard** (1864–1900), Amer. poet, b. Normal, Ill. ('Launcelot and Guenevere'); quoted, **2487.** With Bliss Carman wrote three volumes of 'Songs from Vagabondia'.
**Howard.** Great Eng. family, whose head is the Duke of Norfolk, first duke and earl marshal of England, and whose branches hold many other peerages; rose to greatness and misfortune in Tudor reigns.
**Howard, Bronson** (1842–1908), Amer. dramatist, b. Detroit, Mich.; chief plays, **1038.**
**Howard, Catherine** (1520?–42), 5th queen of Henry VIII of England; beheaded, **1636.**
**Howard, John** (1726–90), Eng. philanthropist and prison reformer; work remedied shocking abuses; **2920.**
**Howard, John Eager** (1752–1827). Amer. Rev. officer, b. Baltimore County, Md.; fought at Germantown, Monmouth, Cowpens, Eutaw Springs; gov. of Md. 1789–92; much of land he owned now in city of Baltimore.
**Howard, Oliver Otis** (1830–1909). Amer. Civil War general, commissioner of Freedmen's Bureau 1866–72; instrumental in establishing Howard Univ. for negroes, its president 1869–73; founded Lincoln Memorial Univ. for mountain whites at Cumberland Gap, Tenn.
**Howard of Effingham, Charles Howard,** 2d **Baron** (1536–1642), created Earl of Nottingham 1596, Eng. lord high admiral, influential with Queen Elizabeth, his kinswoman; and Span. Armada, **211.**
**Howard University,** at Washington, D.C.; co-ed.; founded 1867; nonsectarian; liberal arts, applied science, education, medicine, law, theology; **3685.**
**'How Big-Head Slew the Cave-Bear',** story, **668–70.**
**How'dah,** box for riding elephant, **1127.**
**Howe, Elias** (1819–67), inventor of the sewing machine, **1688–9, 3187, 3787.**
**Howe, Joseph** (1804–73), Canadian statesman, journalist, orator, b. Halifax, N.S.; premier of Nova Scotia 1860–63; strong opponent **of**

Confederation, but after it was secured acccpted position 1867–73 in Macdonald's first cabinet; an orator of great force and magnetism; and Tupper, **3553.**

**Howe, Julia Ward** (1819–1910), Amer. writer and reformer, b. New York; wife of Samuel Gridley Howe; wrote 'Battle Hymn of the Republic'; **2405, 3778;** poem 'Our Country', quoted, **2697.**

**Howe, Richard Earl** (1726–99). Eng. admiral, one of greatest Brit. naval commanders; commandcd Brit. sea forces in Amer. Rev.; relieved Gibraltar 1782; gained victory of "glorious first of June" 1794 over French off Ushant.

**Howe, Samuel Gridley** (1801–76), pioneer educator and humanitarian reformer, b. Boston, Mass.; founder and first superintendent of the Perkins Institution for the Blind; founder of the first school in the U.S. for idiots and the feeblcminded; teaches Laura Bridgman, **436.**

**Howe, Sir William** (1729–1814), Brit. general, younger brother of Richard, Lord Howe, whom he later succeeded as viscount; commander-in-chief of Brit. land forces in N. Amer. 1775–78 during Amer. Rev.; **3002–3, 3004;** condemns Nathan Hale, **1565;** battle of Long Island, **3002, 2061.**

**How'ell, Clark** (born 1863). Amer. journalist, succeeded Henry W. Grady as managing editor 1889 (editor-in-chief after 1897) of the *Atlanta Constitution*, which he maintained as one of the leading papers of the South; served several terms in Ga. legislature, and after 1894 member of Democratic National Committee.

**Howell, John B.,** Amer. manufacturer, **3667.**

**Howells, William Dean** (1837–1920), Amer. novelist, essayist, and critic, **1689–90, 115,** *picture*, **114.**

**How'itzer,** a cannon, **633.**

**Howler monkey, 2290,** *picture*, **2289.**

**How'rah.** Industrial and r.r. center, suburb of Calcutta, India, separated from it by Hugli R.; pop. 179,000; jute, cotton, iron, and machinery mfrs.

**Hoxie, Vinnie Ream** (1847–1914). Amer. sculptor, b. Madison, Wis.; first woman sculptor to receive a commission from U.S. govt. ('Lincoln'; 'Sequoyah'—both in U.S. Capitol).

**Hoy** (Norse "high island"), 2d in size (53 sq. mi.) of Orkney Isls., **2601.**

**Hoyle, Edmond** (1672–1769). Eng. author of works on rules of whist and other games, long regarded as authoritative, so that "according to Hoyle" has become a proverbial phrase.

**Hruod'land, Count,** or **Roland, 3038.**

**Hsu-Shih-Chang** (*shü shē chäng*) (born 1853). Chinese statesman, elected 1918 pres. of Chinese republic, resigned 1922.

**Huasteca** (*wäs-tā'kȧ*), Mex. oil dist., **2212.**

**Hub'bard, Elbert** (1859–1915). Amer. writer, b. Bloomington, Ill.; founded and edited *The Philistine*, "a magazine of protest"; wrote series of 'Little Journeys' about famous men, 'A Message to Garcia', many other books; as a business man (Roycroft shop), shrewdly commercializing his own idiosyncrasies; died on *Lusitania*.

**Hubbard, Leonidas, Jr.** (1872–1903). Amer. journalist and explorer; with Dillon Wallace in 1903 penetrated 250 mi. farther into Labrador interior than any previous white explorers; overtaken by winter and died from exposure.

**Hubbard squash, 3333.**

**Huber** (*ü-bêr'*), **François** (1750–1831). Swiss naturalist, first to gain scientific knowledge of the wonderful life of becs.

**Hubert** (*hū'bērt*), **Saint** (d. 727 A.D.). Apostle of the Ardennes and patron of huntsmen.

**Hubertsburg, Peace of,** signed 1763, in chateau of Hubertsburg in Saxony, Germany, ending Seven Years' War, **3180.**

**Hüb'nerite,** a tungsten ore, **3548.**

**Huckleberry, 439.**

**'Huckleberry Finn',** story by Mark Twain, **3569.**

**Hud'dersfield,** England, mfg. town 25 mi. n.e. of Manchester; pop. 180,000; wool cloth center; **1160.**

**Hudibras** (*hū'di-brăs*), hero of a mock epic poem of that name by Samuel Butler; satire on Puritanism, **1165.**

**Hudson, Henry** (1575?–1611), Eng. navigator, **1690–1, 2860,** *map* of voyages, **110;** explores Hudson R., **2482, 2484;** lands on Concy Isl., **857.**

**Hudson, Henry Norman** (1814–86). Amer. Episc. clergyman and Shakespearean scholar, b. Cornwall, Vt.

**Hudson, W. H.** (1851–1922). Eng. naturalist and romancer; Galsworthy called him "a simple narrator who is well-nigh unsurpassed, a stylist who has few, if any, living equals" ('The Purple Land'; 'Green Mansions'; 'The Naturalist in La Plata'; 'Far Away and Long Ago').

**Hudson,** N.Y. Port of entry on e. bank of Hudson R., 28 mi. s. of Albany; pop. 11,745; makes knit goods, cement, machinery, r.r. equipment, auto bodies, mattresses; once important foreign and whaling port.

**Hudson Bay,** Canada, the 3d largest land-locked sea in the world, **1690,** *maps*, **602–3, 616;** discovered, **1690;** importance to Canada, **603.**

**Hudson Bay Railway, 603.**

**Hudson-Fulton celebration, 1690.**

**Hudson River,** principal r. of New York state, and one of the most important highways of commerce in U.S., **1692,** *map*, **2480,** *pictures*, **2481;** geologic origin, **2482;** highway to the west, **3581, 3582, 2480, 2484;** "tubes" or subways, *pictures*, **3550, 3551.**

**Hudson River School** of Amer. painters, **2634.**

**Hudson's Bay Company,** Brit. trading company in Canada, **1692;** aids exploration, **2860;** fur trade, **3527, 1690, 1084,** *picture*, **3529:** main offices, **2052;** Northwest Territories, **2528, 2137, 3129;** in "Oregon country," **2597–8, 513.**

**"Hudson seal,"** a fur, **2385.**

**Hudson Strait,** connects Hudson Bay with Atlantic, **1690,** *map*, **602–3.**

**Hué** (*ü-ā'*), fortified city, cap. of Anam, Fr. Indo-China; pop. 60,000; on Hué R., 10 mi. from mouth; **1777.**

**Hue and cry.** Old Eng. common-law practice of pursuing criminal with "horn and voice" ("hue" from old Fr. verb *huer*, to cry or shout).

**Huerta** (*wĕr'tä*), **Victoriano** (1854–1916), Mex. general, fullblooded Indian; overthrew Madero administration and made himself pres. 1913; suspected of authorizing Madero's murder 4 days later; was refused recognition by the U.S.; resigned 1914; arrested in U.S. fomenting a revolution against Mexico; died before trial: **2217.**

**Huerta,** Span. for plain, **3614.**

**Hug'gins, Sir William** (1824–1910). Eng. astronomer, pioneer in spectroscopic astronomy; introduced spectroscopic photography into astronomy.

**Hugh Capet.** *See in Index* **Capet, Hugh.**

**Hughes, Charles Evans** (born 1862), Amer. lawyer and statesman, **1692–3, 3747;** Roosevelt supports, **3062.**

**Hughes, David Edward** (1831–1900), Amer. inventor, b. England (printing telegraph, microphone, and induction balance); **3765.**

**Hughes, Sir Sam** (1853–1921), Canadian soldier and political leader, **1693.**

**Hughes, Thomas** (1823–96). Eng. author and social reformer, founder of the abortive coöperative colony at Rugby, Tenn.; his books 'Tom Brown's School Days' and 'Tom Brown at Oxford' did much to fix ideals of English public schools.

**Hugh of Lincoln.** Eng. boy said to have been put to death by Jews at Lincoln in 13th cent.

**Huginn** (*hụ̄g'in*), in Norse myth., one of ravens of Odin, *picture*, **2561.**

**Hugli** (*hụ'gli*), the westernmost arm of the Ganges R., **1393, 572.**

**Hugo** (*hū'gō*), **Victor Marie** (1802–85), Fr. writer, author of 'Les Miserables', **1694–6, 1365;** quoted on architecture, **177;** 'Story of Jean Valjean', **1695–6;** 'Toilers of the Sea', **942.**

**Huguenots** (*hū'gĕ-nŏts*), Fr. Protestants of 16th and 17th cents., **1696, 1352;** Henry II begins persecution, **1636;** Coligny, **826;** St. Bartholomew's Massacre, **826, 696, 2191;** Henry of Navarre and the Edict of Nantes, **1637;** Richelieu crushes, **3018;** settlements in N. Amer., **826, 3292, 699;** colony in S. Africa, **3279;** spread silk industry in w. Europe, **3235, 1154.**

**'Huguenots, The',** opera by Meyerbeer, **2584.**

**Hulagu Khan** (*hụ-lȧ-gụ' kän*) (d. 1265), Mongolian leader, first independent ruler of Persia, **2285.**

**Hull, Isaac** (1773–1843), Amer. commodore who gained first Amer. naval victory in War of 1812; commands *Constitution*, **2423, 3672.**

**Hull, William** (1753–1825), Amer. Rev. officer, general in War of 1812; surrendered Detroit to British 1812; court-martialed and sentenced to be shot, but pardoned by Pres. Madison; **725.**

**Hull,** seaport in n.e. England on Humber R.; pop. 291,000; official name Kingston-upon-Hull; **1160.**

**Hull,** industrial city in s.w. Quebec; pop. 27,000; lumber products, matches, pulp, paper, packed meats, cement, lime, clothing; **2604.**

**Hull House,** famous social settlement in Chicago, **17.**

**'Human Comedy',** series of Balzac's novels, **323.**

**Human geography, 1416.**

**Hu'manists,** classical scholars of the Renaissance, **2996.**

**Humber River,** estuary formed by Trent and Ouse rivers in n.e. England, **1160.**

**Hum'bert I** (1844–1900), king of Italy; succeeded 1878; popularly called "Humbert the Good" because of courage and generosity in plague and earthquake; fostered Triple Alliance and inaugurated policy of colonial expansion; assassinated, **1840;** street in Rome named for, **3056.**

**Hum'boldt, Alexander, Baron von** (1769–1859). Ger. naturalist, explorer, founder of modern science of physical geography, and contributor to nearly every branch of science ('Kosmos').

**Humboldt, Karl Wilhelm, Baron von** (1767–1835). Ger. philologist, statesman, and writer, first to define philosophy of speech; brother of Alexander von Humboldt.

**Humboldt River,** rises in n.e. part of Nevada, flows 375 mi. into Humboldt L. (or Sink), *map,* **2445.**
**Humboldt's woolly monkey,** a spider monkey of Brazil, *picture,* **2288.**
**Hume, David** (1711–76). Brit. philosopher, historian, and political economist ('Inquiry Concerning Human Understanding'; 'History of England').
**Humid'ity,** moisture content, **1207;** affected by trees, **3532;** in houses, **1622;** how measured, **1717.**
**'Humility',** a Little Talk by Arthur Mee, **1697.**
**Humming-bird,** **1698,** *picture,* **416;** courtship, *picture,* **406;** eggs and care of young, **408;** feathers, **1229;** nest, **406.**
**Humors,** of the eye, **1214.**
**Humpback whale,** **3724,** *picture,* **3725.**
**Humped ox,** **3838.**
**Humperdinck** (*hum'pēr-dĭnk*), **Engelbert** (1854–1921), Ger. composer, **2381.**
**Humus** (*hū'mŭs*), soil, **3273, 1235.**
**Hunan'.** An inland province of China; 83,380 sq. mi.; pop. 25,000,000; cap. Changsha; immense coal and iron deposits; one of chief tea-producing regions of the world.
**'Hundley',** submarine, **3378.**
**Hundred,** a unit of local govt. in Delaware, **989.**
**"Hundred Days,"** period between date of Napoleon's return to Paris from Elba, March 20, 1815, and the restoration of Louis XVIII, June 28; **2396, 2067.**
**"Hundred-handers"** (*Hecatoncheires*), giants in Gk. myth., **3607.**
**Hundredweight,** a unit of measure, **3714, 3715.**
**Hundred Years' War** (1337–1453), between England and France, **1699–1701, 694–6, 1634–5;** causes, **1699, 2763;** battle of Crécy, **1699, 635, 1552;** battle of Agincourt, **42, 1634;** capture of Calais, **570;** Joan of Arc, **1893–4, 694–6;** results, **1352, 1634;** Froissart's 'Chronicles', **1375.**
**Huneker** (*hŭn'ĕ-kĕr*), **James G.** (1860–1921), Amer. musical, literary, and dramatic critic, b. Philadelphia; did more than any other man of his day to familiarize the U.S. with the best contemporary European literature ('Iconoclasts'; Egoists'; 'Unicorns'; 'Steeplejack').
**Hungarian** or **Magyar language,** **1702–3.**
**'Hungarian Rhapsodies',** musical compositions by Liszt, **2026.**
**Hun'gary,** a republic in cent. Europe; 36,500 sq. mi.; pop. 7,850,000; cap. Budapest; **1702–4,** *maps,* **271, 308, 1196–7;** agriculture, **1702, 1190, 271, 2973;** Budapest, **524;** Carpathian Mts., **646–7, 3115;** climate, **2973;** Danube R., **961–2;** foreign trade, **1703, 524, 962;** emigration to U.S., **2572, 2718;** minerals, **647, 1411.** —*History,* **1703;** Otto I defeats Magyars, **2606;** becomes Hapsburg possession under Frederick III, **1360;** Turks conquer, **3559, 2988;** Revolution of 1848, **1945, 273, 1354;** Dual Monarchy formed, **1703, 273;** in World War and Peace settlement, **3794, 3795, 1703.**
**Huns,** barbarian people of cent. Asia who invaded Europe in 4th and 5th cents., **1704, 1491, 1194.**
**Huns, White,** or **Ephthalites,** tribe of cent. Asia living near Oxus in 5th and 6th cents. A.D.; terrorized Persia and India; **1752.**
**Hunt, Helen.** *See in Index* **Jackson, Helen Hunt.**
**Hunt, Holman** (1827–1910), Eng. Pre-Raphaelite painter ('The Light of the World'; 'Finding of Christ in the Temple'), **2632.**
**Hunt, Leigh** (1784–1859). Eng. poet and essayist, friend of Byron, Keats, and Shelley ('Abou Ben Adhem'; 'Autobiography').
**Hunt, Richard Morris** (1828–95). Amer. architect; designed pedestal for Bartholdi's 'Liberty', Administration Building of Chicago World's Fair, and many other notable structures; established earliest Amer. training school of architecture.
**Hunt, William Morris** (1824–79), Amer. painter; brother of R. M. Hunt; **2634.**
**Hunter, John** (1728–93). Brit. physiologist and surgeon, one of world's greatest anatomists; introduced experiment into study of physiology.
**Hunter, Robert Mercer Taliaferro** (1809–87). Confederate sec. of state (1861) and peace commissioner (1865); b. Essex county, Va.; member of Congress 1837–43 and 1845–47; in senate 1847–61.
**Hunter College of the City of New York.** Established 1870 as Normal College (name changed 1914); for women; only residents of city admitted; liberal arts; also model kindergarten, elementary school, and high school.
**Hunting:** Assyrian (anc.), *picture,* **296;** elephant, **1130,** *picture,* **1131;** falconry or "hawking," **1220;** fox, **1336;** grizzly bear, **350, 355;** horns used, **1681;** lion, among Kaffirs, *picture,* **2024;** quail, **2943;** rifles and shotguns, **1256–7;** with a camera, **2414,** *pictures,* **2406, 2407, 2410.**
**Hunting dogs, 1021–2.**
**Hunt'ingdonshire.** A small inland county in e. England; 366 sq. mi.; pop. 54,000; cap. Huntingdon.
**Hunting spider,** *picture,* **3322.**
**Huntington, Collis P.** (1821–1900). Amer. capitalist, one of chief promoters of Central Pacific, Southern Pacific, and Chesapeake and Ohio railroads.
**Huntington,** Ind. Mfg. city on Little Wabash R., 23 mi. s.w. of Fort Wayne; pop. 14,000; shoes, iron and steel products, rubber goods.
**Huntington,** W. Va. Commercial and industrial city on Ohio R., 15 mi. s.e. of Ironton, Ohio; pop. 50,177; car-shops of Chesapeake & Ohio R.R., foundries, lumber mills.
**Huntsman, Benjamin** (1704–76), Eng. inventor and steel manufacturer, **3200.**
**Huntsville,** Tex., city 70 mi. n. of Houston; pop. 4689; cotton trade; state penitentiary; **3478.**
**Hunyady** (*hun'yad-i*), **Janos** or **John** (1387?–1456), national hero of Hungary, great warrior and statesman; by his defense of Belgrade against the Turks in 1456 made Hungary independent for 70 years; **1703, 3559.**
**Hupeh** (*hu-pā'*). A cent. province of China; 71,410 sq. mi.; pop. 21,300,000; cap. Wuchang; chief city Hankow; coal, iron.
**Hu'ron,** Ohio, village on L. Erie, 44 mi. w. of Cleveland; pop. 1703; **2570.**
**Huron,** S.D. Distributing center for agricultural and stock-raising region, 110 mi. e. of Pierre; pop. 8302; Huron College.
**Huron, Lake,** 2d largest of the Great Lakes, **1704–5, 1510–4,** *map,* **1511;** canals, **627, 3129.**
**Huron College.** At Huron, S.D.; co-ed.; Presb.; founded 1883 at Pierre as Pierre Univ.; name and location changed 1898; academic, collegiate, commercial, and music depts.
**Hurons** or **Wyandots,** tribe of Indians originally living in Ontario along Georgian Bay; driven into upper peninsula of Mich.; later into lower peninsula and Ohio; **1766.**
**Hurricanes, 3366;** of Caribbean Sea, **644;** forecasting, **3707;** Galveston, **1392.**
**"Huskies,"** Eskimo dogs, *picture,* **1020.**
**Huss, John** (about 1369–1415), Bohemian religious reformer and martyr, **1705.**
**Hussein.** *See in Index* **Hasan.**
**Hussite Wars** (1419–34), **447, 1705.**
**Hutchinson, Anne** (1600?–43). Amer. religious enthusiast, b. England, whose teachings to women of Massachusetts colony threatened supremacy of ministers; banished from Mass.; later killed by Indians.
**Hutchinson, Arthur Stuart Menteth** (born 1879). Eng. novelist, b. India ('Once Aboard the Lugger'; 'The Happy Warrior'; 'If Winter Comes'; 'This Freedom').
**Hutchinson, Thomas** (1711–80). Tory gov. of province of Mass. and historian, b. Boston, Mass.; author 'History of the Colony of Massachusetts Bay'; quoted, **16.**
**Hutchinson,** Kan. Mfg. city on Arkansas R. 42 mi. n.w. of Wichita; pop. 23,298; salt; meat packing and shipping center.
**Hutten, Ulrich von** (1488–1523), Ger. humanist reformer and satirical writer, friend of Luther; in Reformation, **2987.**
**Hutton, James** (1726–97). Scotch landowner and geologist; propounded modern view that existing land forms were developed gradually by same processes that are at work today ('Theory of the Earth').
**Huxley, Thomas H.** (1825–95), Eng. biologist, educator, and essayist, **1705–6.**
**Huygens** (*hī'gĕnz*), **Christian** (1629–95), Dutch mathematician, astronomer, and physicist; applied pendulum to the clock; improved the telescope, and discovered a satellite of Saturn; originated and developed mathematically theory that light consisted of ether vibrations, **1998.**
**Huysmans** (*ūs-män'*), **Joris Karl** (1848–1907). Fr. realistic novelist, profoundly pessimistic and a master of psychological analysis ('A rebours'; 'En route'; 'La Cathédrale').
**Hwang-Hai** (*hwäng-hī*). *See in Index* **Yellow Sea.**
**Hwang River,** 2d largest r. in China (2700 mi.), **1706;** Shantung built by, **3195.**
**Hy'acinth,** plant of the lily family, with flowers clustered into spike, **1706–7.**
**Hyacin'thus,** in Gk. myth., beautiful youth accidentally killed by Apollo, **1706.**
**Hyades** (*hī'à-dēz*), a V-shaped constellation, including star Aldebaran; location, *chart,* **873.**
**Hy'att, John Wesley** (born 1837), Amer. inventor, b. Starkey, N.Y.; probably his greatest contribution to science was a method of purifying large bodies of water; invents celluloid, **672–3.**
**Hy'brid,** a plant or animal produced by cross-breeding of different species or varieties, **538, 2830;** Bartlett plum, **2840;** cottalo, **431;** in fruit-growing, **1377:** limequat, **2011;** loganberry, **2046, 2977;** pears, **2701;** peonies, **2723;** "primus" berry, **2977.**
**Hybrid tea rose,** *picture,* **3067.**
**Hydas'pes River.** *See in Index* **Jhelam River.**
**Hyde, Douglas** (born 1860). Irish scholar and author; helped found Gaelic League (1893) pres. of Gaelic League (1893–1915); worked to make Gaelic a living language.
**Hyde Park,** London, **2055.**
**Hyderabad** (*hī-dà-rà-bäd'*), largest and most important state of In-

dia; 82,698 sq. mi.; pop. 14,000,000; **1707, 1746,** *map,* **1745.**

**Hyderabad,** cap. of Hyderabad state, India; pop. 500,000; 4th largest city in India; **1707.**

**Hyder Ali** (*hī'dēr ä'lē*) (1722?–82). Indian ruler and commander, most formidable Asiatic rival of British in India; crushed by British, **1596, 1753.**

**Hy'dra,** in Gk. myth., nine-headed monster slain by Hercules, **1640.**

**Hydra,** a primitive water animal, **1707–8;** evolutionary position, *diagram,* **128.**

**Hydrangea** (*hī-drăn'ġē-ȧ*), a flowering shrub, **1708;** in hedges, **1628.**

**Hydrau'lic cement,** any cementing substance which hardens after wetting, **674.**

**Hydraulic dredge,** one that excavates under water by suction, **1041.**

**Hydraulic elevator,** one that operates by hydraulic power, **1132, 1134.**

**Hydraulic machinery,** machinery which uses water as a power source or to apply power to work, **1708–10;** depends upon incompressibility of water, **3696;** elevators, **1132, 1134.**

**Hydraulic mining,** excavation of surface ore by washing down with powerful streams of water; practiced in gold mining, **1480,** *pictures,* **78, 1300.**

**Hydraulic organ, 2600.**

**Hydraulic press,** machine using hydraulic power to apply pressure, **1710,** *picture,* **1709;** used in steel industry, **1826.**

**Hydraulics,** science of force in liquids, **1710, 4030.** Archimedes principle, **174;** siphon, **3243;** water turbines, **3553–4.**

**Hydrocar'bons,** compounds consisting of hydrogen and carbon, **642, 1710, 4043;** "aromatic," **384;** fats and oils, **1225-7;** in illuminating gas, **1406;** petroleum and its allies, **2750.**

**Hydrochlo'ric** or **muriatic acid,** an acid composed of hydrogen and chlorine in equal parts, **1710, 755, 10;** in aqua regia, **1482;** in gastric juice, **3360, 2724;** Le Blanc process, **3272.**

**Hydrocyan'ic acid,** a poisonous compound of hydrogen, carbon, and nitrogen in equal parts, **944;** causes instant death, **2855;** dangerous as fumigator, **151.**

**Hydroelectric power,** electricity from dynamos driven by waterpower, **3554, 3695;** Niagara plants, **2502, 3694;** transmission, **3523–4, 582;** U.S. plants in lighting service, **1124;** Washington's resources, **3688.** *See also in Indcx* **Waterpower.**

**Hydro-extractor,** a centrifugal drying machine used in laundries, **1969.**

**Hydrofluor'ic acid,** a compound of hydrogen and fluorine in equal parts; etches glass, **10, 755.**

**Hy'drogen,** the lightest known chemical element, **1710, 4042;** in all acids, **8, 10;** in atmosphere, *picture,* **51;** burns with invisible flame, **1250;** combining properties, **4039;** in illuminating gas, **1406, 1407;** indispensable to living organisms, **394;** specific heat highest known, **3696;** used in balloons, **312.**

**Hydrogen Chloride.** Same as **Hydrochloric acid.**

**Hydrogen peroxide** or **dioxide,** a compound of hydrogen and oxygen in equal parts ($H_2O_2$); bleaching properties, **435;** as antiseptic, **151.**

**Hydrogen sulphide,** a vile-smelling, gaseous compound of hydrogen and sulphur ($H_2S$), **3389.**

**Hydrogen welding,** welding with heat created by burning hydrogen, **3716.**

**Hydrograph'ic Office,** U.S., a branch of the Bureau of Navigation, U.S. Navy; charged with issuing charts of foreign waters, general charts of U.S. waters, based upon those of the Geodetic Survey, and tables and bulletins useful to navigators; iceberg charts, **1722.**

**Hydrographic surveying,** surveying of oceans, lakes, and rivers, **3398.**

**Hydrol'ysis,** absorption of water by a compound, with resulting chemical change; of starch, **890.**

**Hydrom'eter,** instrument for determining density of liquids, **1711.**

**Hydrophobia** (*hī-drō-fō'bi-ȧ*) or **rabies,** disease caused by an unknown virus in saliva of infected animals, and inoculated by their bites; prevented by Pasteur treatment, **2692, 151–2;** virus attacks nerves, **1450.**

**Hy'drophone,** device for listening under water; used in World War to detect submarines, **3378.**

**Hy'drophytes,** plants which live in watery locations, **3700.**

**Hy'droplane** or seaplane, airplane equipped with floats for resting on water, **60,** *pictures,* **57, 63, 2428.**

**Hydroplane motor boat,** speed type, with hull shaped to make it skim over surface, **2357.**

**Hydrostat'ic paradox, 4030.**

**Hydrostatics,** science of pressure and other phenomena in liquids at rest, **4030;** law of floating bodies, **174, 1509.**

**Hydrot'ropism,** the tendency of plant structures to grow toward water, **2828.**

**Hydrox'ide,** a compound containing one or more elements in combination with hydroxyl (HO); all alkalies included, **10;** of calcium, **571, 2010;** of potassium, **2900;** of sodium, **3271.**

**Hydroxyl, 4043.**

**Hydrozo'a,** a class of primitive coelenterate animals, **3944;** coral-forming types, **886;** hydras, **1707–8;** jelly-fish, **1883–4.**

**Hyena** (*hī-ē'nȧ*), a dog-like carrion-eating animal, **1711.**

**Hygeia** (*hī-ġē'ȧ*). In Gk. myth., goddess of health.

**Hygiene** (*hī'ġēn*), **1712–6, 1675;** alcohol, effect on health, **84;** athletics, **251–2;** danger of promiscuous drugging, **1042;** diet, **1320–2;** digestion, **1011;** exercise, **2784–5, 1617;** of the eye, **1214, 1216;** fresh air, its importance, **2998–9;** heating and ventilation, **1621–4;** humidity and health, **1207;** necessity of play for children, **2832, 2834;** public water supply, **3703–4, 1715;** quotations on health, **1713;** sanitation and sewerage, **3183, 2840, 1452, 595, 1312–3;** sleep, **3251;** of teeth, **998, 3454.** *See also in Index* **Medicine and surgery; Physiology;** and chief topics above by name.

**Hygrom'eter,** instrument for measuring moisture in air, **1717, 1622.**

**Hyksos** (*hik'sŏs*), or Shepherd Kings, dynasty of foreign rulers of Egypt, **1102.**

**Hyla** (*hī'lȧ*), the tree-frog, **1375,** *picture,* **1373.**

**Hy'men,** in Gk. myth., god of marriage, **1854.**

**Hymenop'tera,** an order of membranous-winged insects, **1788, 3947;** ants, **145;** bees, **364;** wasps and hornets, **3693.**

**Hymet'tus, Mt.,** peak of Attica, bounding Athenian plain on s.e.; 3370 ft.; famous for honey in anc. times; **1529, 249.**

**Hynd'man, Henry Mayers** (1842–1921). Eng. socialist; founded the Social Democratic Federation in Gt. Brit.; defended free institutions, particularly in Ireland and India.

**Hyndman Peak,** summit of Rocky Mts. in s.-cent. Idaho, **3036.**

**Hypatia** (*hī-pā'shi-ȧ*) (370?–415 A.D.). A Gk. woman mathematician and philosopher famed for her beauty and wisdom; head of Neo-Platonic school at Alexandria: murdered by Christian mob; the heroine of Kingsley's 'Hypatia'.

**Hyperbole** (*hī-pēr'bō-lē*), a figure of speech, **1238–9.**

**Hyperbo'reans.** In Gk. myth., a "blameless" people dwelling in a land beyond the north wind, a paradise of perpetual sunshine and youth; connected with worship of Apollo.

**Hyperion** (*hī-pēr'i-ŏn*). In Gk. myth., a Titan, father of Helios the sun-god; later, sometimes the sun-god himself.

**Hypermetamor'phosis,** the type of insect growth in which the larva undergoes more than one transformation before becoming a pupa, **370, 1786.**

**Hypermetro'pia** or far-sightedness, inability to see objects close at hand, **1214.**

**Hyphen,** use of, **2936.**

**Hyp'notism, 1717–8, 3327.**

**Hyp'num tamaris'cum,** a moss, *picture,* **2339.**

**Hy'po,** a commercial name for sodium thiosulphate ($Na_2S_2O_3$), **3271, 3390;** often sold under incorrect name of sodium hyposulphite. *See in Index* **Hyposulphite of sodium.**

**Hypogynous** (*hī-pŏġ'i-nŭs*) **flowers, 3939.**

**Hyposul'phite of sodium,** a salt of sodium and hyposulphurous acid ($Na_2S_2O_4$), **3272;** name often applied incorrectly to sodium thiosulphate ("hypo") used in photography, **3271.**

**Hypoth'esis,** in geometry, **1426.**

**Hy'son tea,** *picture,* **3446.**

**Hysteria** (*hĭs-tē'ri-ȧ*), **2930–1.**

# I

THE ninth letter of the alphabet is one of the simplest of the letters in form, but it was not always so. Among the Egyptians it was represented by two parallel lines 𓏲 and the scribes wrote it like this 𓇋 The Phoenicians gave it the form 𐤉 and called it *Yod*. As written by the Hebrews (יוד) *Yod* was such a little insignificant letter that its name came to be used for the smallest part, the least bit of anything (our word "jot"). Thus Christ is quoted as saying, "Till heaven and earth pass, one jot or one tittle shall in no wise pass from the law, till all be fulfilled" (Matthew v, 18). The Greek word for the letter I (*Iota*) is used in the same way. Among the Greeks *Iota* was first written as a zigzag mark resembling a thunderbolt, but it finally straightened up into the upright I, which the Romans adopted. The old letter *Yod* had originally been a consonant with a sound like that of our *y*. In Latin it was used sometimes as a vowel and sometimes as a consonant. As a vowel, its name and its long sound originally rhymed with "bee," and it was not until the end of the 16th century that its long sound in English became *ai*. The "i" sounds (long and short) are the most frequent of all vowel sounds in English, though the letter E occurs more frequently.

**Iago** (*ē-ä'gō*), villain in Shakespeare's 'Othello', **2603–4.**
**Iambus** (*ī-ăm'bŭs*), in poetry, **2851.**
**Ibañez** (*ē-bä'nyĕth*), **Vicente Blasco** (born 1867), Span. novelist, author of 'The Four Horsemen of the Apocalypse', **1719, 3615,** *picture,* **3307.**
**Iberia** (*ī-bē'ri-ȧ*). Anc. dist. between Caucasus Mts. and Armenia, now part of Georgia; also anc. name of Spain.
**Ibe'rian Peninsula,** in s.w. Europe, **1188, 1192,** *maps,* **1190–1, 3300.** *See also in Index* **Portugal; Spain.**
**Iberian people,** anc. race, ancestors of modern Basques; in France, **1343, 1344;** in Spain, **3301.**
**Iberville** (*ē-bĕr-vēl'*), **Pierre Lemoyne, Sieur d'** (1661–1706), Fr.-Canadian explorer and naval and military commander; founded La., **2072.**
**I'bex,** a type of mountain goat, **1719.**
**I'bis,** a wading bird (order *Herodiones*), **3362;** sacred ibis of Egypt, **3364, 1106,** *picture,* **3363;** "wood ibis" (a stork), **3362;** scientific names, **3365.**
**Ibrahim Pasha** (*ĭb-rä-hēm' pȧ-shä'*) (1789–1848). Egyptian general, adopted son of Mehemet Ali, viceroy of Egypt; Turkish commander (1826–28) in Gk. war for independence.
**Ibrail** (*ē-brä-ēl'*), Rumania. Same as **Braila.**
**Ib'sen, Henrik** (1828–1906), Norwegian dramatist, **1720;** contrasted with Björnson, **432;** father of drama of protest, **1036;** world influence, **3134.**
**Icarus** (*ĭk'ȧ-rŭs*), in Gk. myth., son of Daedalus, **949.**
**Ice,** 1720; artificial, **2990;** natural, **2989, 2992;** harvesting, *picture,* **2990;** physics of freezing and melting, **1361, 3696.** *See also in Index* **Snow.**
**Ice Age, 1720–1;** Agassiz helps establish theory, **41;** caused bird migrations, **2232;** in Europe, **1720, 2529, 41;** geologic era, **1420.** —*In N. Amer.,* **2516, 1720–1;** Ind., **1757;** L. Agassiz, **1721, 2253, 2136;** Ohio, **2571;** Wis., **3768.**
**Icebergs, 1721–2;** Greenland, **1540;** in Labrador current, **255.**
**Ice boating, 3756,** *picture,* **3755.**
**Ice-cap,** a type of glacier, **1465, 1466;** Antarctic, **145;** Greenland, **1540.**
**Ice cream,** value as food, **2239.**
**Ice hockey, 1670,** *picture,* **3755.**
**Iceland,** isl. of n. Atlantic; 40,000 sq. mi.; pop. 92,000; cap. Reykjavík; **1722–4,** *map,* **1196–7;** geysers, **1454;** union with Denmark, **997;** woman suffrage, **3779.**
**Icelandic language, 1724.**
**Iceland moss,** a lichen, **1994;** not a moss, **2340.**
**Iceland spar,** transparent calcite, **571, 1724;** double refraction, *picture,* **1999;** polarization of light, **2000.**
**Ice Mountain,** W.Va., **3720.**
**Ichabod** (*ĭk'ȧ-bŏd*) **Crane.** *See in Index* **Crane, Ichabod.**
**Ichneumon** (*ĭk-nū'mŏn*), a weasel-like mammal, **1724;** Indian, or mongoose, **2286.**
**Ichneumon flies, 1724;** egg-laying habits, **1090.**
**Ichthology** (*ĭk-thĭ-ŏl'ō-jĭ*), the science of fishes. *See in Index* **Fish.**
**Ichthyosaurs** (*ĭk'thĭ-ō-sąrz*), prehistoric aquatic reptiles, **136;** classification, **2997.**
**Icon.** Same as **Ikon.**
**Iconium** (*ī-kō'nĭ-ŭm*). *See in Index* **Konia.**
**Iconoclast** (*ī-kŏn'ō-klăst*). Literally an image-breaker; in church history, 8th–9th cents., member of Byzantine party opposed to use of images in worship; today, one who shatters tradition.
**Icteridae** (*ĭk-tĕr'ĭ-dē*), a bird family (order *Passeres*), **2601, 412,** *pictures,* **417, 418;** blackbirds, **433;** bobolinks, **446;** meadowlarks, **2179;** orioles, **2600–1.**
**Ictinus** (*ĭk-tī'nŭs*) (5th cent. B.C.). Gk. architect, designer of the Parthenon.
**Ida,** mt. range of Asia Minor, 30 mi. s.e. of plain of Troy, **3543.**
**Ida, Mt.,** Crete, now called Psiloráti; fabled birthplace of Zeus, **918.**
**I'daho,** one of the n.w. states of U.S.; 83,888 sq. mi.; pop. 431,866; cap. Boise; **1725–9,** *maps,* **1726, 3584–5;** agriculture and irrigation, **1726–7, 1829;** history, **1727, 1729;** lumbering, **1727;** meaning of name, **1725;** minerals, **1727;** state flower, **3347;** surface, **1725–6;** woman suffrage, **3778.**
**Idaho, University of,** state institution at Moscow, Idaho; co-ed.; opened 1892 (established 1889); classics, science, forestry, home economics, education, engineering, agriculture, law; tuition free except in law and music; **1729.**
**Idaho Falls,** Idaho. Agricultural and live stock center on Snake R., 50 mi. n.e. of Pocatello; pop. 8064; flour mills, sugar factory.
**Idaho Springs,** Colo., town in Clear Creek Cañon, 35 mi. w. of Denver; pop. 1192; famous for mining tunnels (Newhouse tunnel one of longest in world); soda springs, **845.**
**Ide'alism,** a philosophical school, **2772, 2773.**
**Ideographic** (*ī-dē-ō-grȧf'ĭk* or *ĭd-ē-ō-grȧf'ĭk*) or **picture writing, 3816, 100, 101;** Chinese, **744;** Jap., **1871, 1873.**
**Ides** (*īdz*), in the Rom. calendar, 3d "landmark day" in the month; in March, May, July, and Oct., ides fell on the 15th, other months on 13th; Caesar told to "beware the ides of March," **564, 565.**
**Iduna** (*ē-dų'nȧ*), in Norse myth., goddess of youth and spring; 'Apples of Iduna', story, **3135–6.**
**'Idylls of the King',** series of poems by Tennyson based on legends of King Arthur and his knights, **3472;** stories from, **223, 3069, 1391.**
**"If I have faltered more or less,"** poem by Stevenson, **3355.**
**Igloo** (*ĭg'lo*), Eskimo hut, **1175–6.**
**Igna'tius, Saint** (d. 110? A.D.). Bishop of Antioch, Apostolic Father, and eager martyr; legend says he was disciple of the Apostle John.
**Ignatius of Loyola.** *See in Index* **Loyola, Ignatius de.**
**Igneous** (*ĭg'nē-ŭs*) **rocks,** geological class of, **1417;** composition, **1230;** granite, **1497;** quarrying, **2944;** quartz, **2945.**
**Ignis fatuus** (*ĭg'nĭs făt'yu-ŭs*) (Latin "foolish fire"), or will-o'-the-wisp, **3742.**
**Igni'tion,** electric, in gas engines, **1404,** *picture,* **1405.**
**Ignition point,** temperature at which a substance will catch fire, **1249–50.**
**Igorots** (*ē-gō-rōts'*), mountain tribes of Philippines, **2765–6,** *pictures,* **2769, 2766;** eat dogs, **1023.**
**Iguana** (*ĭ-gwä'nȧ*), a lizard of the *Iguanidae* family, **1729;** Amer. chameleon, **686;** foot of, *picture,* **1323;** horned toad, **2037–8;** rhinoceros iguana, *picture,* **2036.**
**Igua'nodon,** a prehistoric reptile, **134.**
**Iguazú** (*ē-gwä-sų'*). River in s. Brazil; rises near Atlantic, flows w. 800 mi. to Parana R.; falls 20 mi. above mouth 215 ft. high, broken into 20 or more falls separated by rocky isls., among finest in world.
**Ikhenaton** or **Akhenaton** (Amenhotep IV) (reigned about 1367–1350 B.C.), Egypt. king of the XVIIIth dynasty, son of Amenhotep III; adopts monotheism, **1105–6.**

**Ik Marvel.** Pen name of Donald G. Mitchell (1822–1908), Amer. author ('Reveries of a Bachelor'; 'Dream Life').
**Ikon** (*ī'kŏn*), an image; in the Gk. church, a venerated image of a sacred person, **2332.**
**I'lex,** a tree or shrub of the holly family (*Ilicaceae*); source of maté, **495.**
**Ilex.** The evergreen, holly, or holm oak (*Quercus ilea*).
**'Il'iad, The',** Gk. epic poem of Trojan War, **1675–6;** stories from, **3542, 8, 9, 248, 1626.** *See also in Index* **Homer.**
**Il'ion,** N.Y. Mfg. village on Mohawk R. and Erie Canal, 12 mi. s.e. of Utica; pop. 10,169; typewriters, firearms, sewing machines.
**Il'ium.** Name for anc. Troy.
**Ilkhan** (*ēl-kän'*). Mongol dynasty of Persia; reigned 1256–1353.
**Illampu, Mt.** Same as **Sorata.**
**Illimani** (*ē-lyē-mä'nē*), volcanic peak of Andes; in Bolivia about 30 mi. s.e. of La Paz; **123.**
**Il'lington, Margaret** (born 1881). Stage name of Maude Light, Amer. actress, b. Bloomington, Ill. ('The Japanese Nightingale'; 'His House in Order').
**Illinois** (*il-i-noi'*), a cent. state of the U.S.; 56,665 sq. mi.; pop. 6,485,280; cap. Springfield; **1730–6,** *maps,* **1731, 3584–5;** agriculture, **1731–2;** cement rock deposits, **676;** chief cities, **1730, 1734, 1736, 720–5, 3331;** coal, **1730, 1732;** commerce and transportation, **1730, 1733–4, 627, 723;** government and education, **1736;** historic places, **1731;** iron and steel manufactures, **1733, 1826;** lead ore, **1974;** meat packing industry and other manufactures, **2180, 1733;** meaning of name, **3347;** rivers and canals, **1730, 1733–4, 627;** state flower, **3347.** —*History,* **1736, 725;** Marquette's explorations, **2151,** La Salle, **1964,** Hennepin, **1632;** George Rogers Clark's expedition, **783;** part of Northwest Territory, **2528;** Chicago founded, **725;** Black Hawk War, **1772;** Mormons at Nauvoo, **2326;** Lincoln-Douglas debates, **2017.**
**Illinois, University of,** at Urbana, Ill.; co-ed.; state control; founded 1867 (opened 1868); arts and sciences, engineering, agriculture, library school, music, law, etc.; State Laboratory of Natural History; *picture,* **1736.**
**Illinois and Michigan Canal, 1733, 725.**
**Illinois College.** Co-ed. Presb. institution at Jacksonville, Ill.; founded 1829; liberal arts, music.
**Illinois Indians,** tribe of Algonquian family, formerly living along Illinois R., **1736;** perished at Starved Rock, **1731.**
**Illinois River,** chief r. of Ill.; flows 500 mi. s.w. to Mississippi R., **1730, 1733–4,** *map,* **1731;** reversed flow and Chicago Drainage Canal, **627, 724;** explorations, **2265, 2151, 1964, 1632;** Starved Rock, **1730,** *picture,* **1732.**
**Illinois Wesleyan University.** At Bloomington, Ill.; co-ed.; Meth. Episc.; founded 1850; liberal arts, law, home economics, fine arts, music, oratory.
**Illinois Woman's College.** At Jacksonville, Ill.; for women; Meth. Episc.; founded 1846; arts and sciences, music, home economics, public speaking, physical education, fine arts.
**Illit'eracy,** comparison of percentages among nations, **2881;** in Argentina, **193;** Australia, **269;** Bolivia, **450;** Brazil, **495;** Chile, **738;** Colombia, **836;** Finland, **1248;** Germany, **2881;** India, **1743;** Italy, **1839;** Spain, **3302;** Switzerland, **2881;** Uruguay, **3608;** Venezuela, **3622.**—*U.S.:* bar to immigration, **1738;** general percentage, **2881;** lowest percentages, **2432, 2525;** negroes, **2434.**
**Illuminated manuscripts, 456.**
**Illuminating gas.** *See in Index* **Gas, illuminating.**
**Illumina'tion.** *See in Index* **Lamps and lighting.**
**Illusions,** in hypnotism, **1717;** makes moving pictures possible, **2352;** mirages, **2260–1;** in parlor magic, **2121;** of touch, **3521.**
**Illustration of books.** *See in Index* **Engraving.**
**Illyria** (*i-lir'i-ȧ*), indefinite region e. of Adriatic Sea; *map,* **1518.**
**Illyrians,** ancestors of modern Albanians, **307.**
**Iloilo** (*ē-lō-ē'lō*), Philippines. Seaport, Panay Isl.; pop. 50,000.
**'Il Pensero'so'** ("the pensive man"). Ode by Milton to "divinest Melancholy," celebrating peace, leisure, contemplation.
**'Il Trovatore'** (*ēl trō-vä-tō'rā*), opera by Verdi, **3307, 2584.**
**Images,** formed by lenses, **1987, 2228, 3462;** in photography, **2778–80.**
**'Imagination',** a Little Talk by Arthur Mee, **1737,** *picture,* frontispiece Vol. 4.
**Imagination,** in children, **735;** psychology, **2930.**
**Imago** (*i-mā'gō*), mature insect, **1786.**
**Imari** or **Hizen ware,** one of finest Japanese porcelains, **1874.**
**Imbros** (*im'brŏs*). Greek isl. in Aegean Sea, near Dardanelles; 87 sq. mi.; anc. Gk. colony, later Turkish possession until 1920.
**Immaculate Conception,** dogma of, established by Pius IX, **2814.**
**'Immaculate Conception',** painting by Murillo, **2372,** *picture,* **2371.**
**Immanuel** (*i-măn'yu-ĕl*) or **Emmanuel.** The divinely appointed deliverer foretold by Isaiah (vii, 14) and recognized by the evangelist in Jesus (Matt. i, 23).
**Immelmann turn,** in flying, *picture,* **61.**
**Immigra'tion,** entrance into a country for permanent residence; the opposite of emigration; Australian policy, **264, 267;** Canada, **617;** S. Amer., **3288.**
**Immigration,** U.S., **1738;** barred by certain diseases, **1612;** Boston, **473;** Chicago, **722;** Chinese Exclusion Act, **1611, 223;** Cincinnati, **766;** Colo., **841;** Fall River, Mass., **1223;** German political refugees, **3772;** immigrants at Ellis Isl., *picture,* **2491;** Irish, **1810;** Italian, **1840;** Mass., **2166;** Milwaukee, **2247;** Mo., **2272;** N.Y., **2486;** New York City, **2495;** Pa., **2718;** relative contributions of various nationalities, **3587,** *picture,* **3581;** Scandinavian, **3134;** S.D., **3297;** Wis., **3771;** 'Story of Mary Antin', **1739–40;** and sweatshop system, **805.**
**Immigration, Bureau of,** U.S., **3600.**
**Immortal'ity,** Egyptian belief in, **3155;** Greek idea of, **1558.**
**Immortelle** (*im-ŏr-tĕl'*), plant with "everlasting" flowers, **1740.**
**Immuniza'tion** to disease, **151.**
**Impeach'ment,** of civil officers, **1740–1;** power of Congress, **862;** Federal judges, **909;** of president, **2914, 1898.**
**Imperative mode, 3627.**
**'Impera'tor',** giant ocean liner, **3218.**
**Imperator,** Rom. title of honor, **258.**
**Impe'rial bushel, 3714.**
**Imperial gallon, 3715.**
**Impe'rialism,** in modern politics, policy of national territorial expansion; Disraeli, **1013;** Ger. tendencies, **1449;** Japan, **1870;** U.S., **2103, 3606.**
**Imperial Valley,** Calif., extends from Salton Sea to Mex. border, **578.**
**Im'post,** in architecture, *picture,* **174.**
**Impres'sionism,** in painting, **2633;** examples by Sorolla, *picture,* **2632;** influence of Japanese art, **1876;** in music, **2380, 2584.**
**Impress'ment** of Amer. seamen, **3670.**
**Impulse turbines, 3554.**
**Impulse waterwheels, 3695.**
**Incandes'cent furnace, 1383.**
**Incandescent lamp, 1123–4;** carbon, **642;** tungsten, **3548;** why vacuum is necessary, **3614.**
**Incanta'tions,** magic words, **2118.**
**Incas** (*ing'kȧz*), anc. S. Amer. race, **1741;** domesticate llamas, **2039;** Pizarro conquers, **2814, 3289;** theory of ethnic relation, **2621.**
**In'cense,** aromatic mixtures which yield a pleasing perfume when burning; made of spices and resins, **2728, 2997, 3317.**
**Inch,** twelfth part of a linear foot, **3714, 3715.**
**Inch worm,** or cankerworm, a caterpillar, **630.**
**Inci'sor teeth, 3452,** *pictures,* **3453.**
**Inclined plane, 2187,** *pictures,* **2190;** probable use in building pyramids, *picture,* **2939.**
**Income tax,** in U.S., **3441;** collected by Treasury Dept., **3598;** constitutional amendment, **3428;** first law declared unconstitutional, **790.**
**Incuba'tion,** of chickens, **2909–10;** of fish, **1280,** *picture,* **1281;** time required for various birds, **408.**
**In'cubator, 2909–10,** *picture,* **2911.**
**Indem'nity,** protection against or compensation for loss or damage; especially, compensation paid by defeated power after war; Boxer Rebellion, **748;** Franco-Prussian War, **1356;** German after World War, **3812, 1444.**
**Independence,** Kan. Industrial city 143 mi. s.w. of Kansas City, Mo., on Verdigris R.; pop. 11,920; center of agricultural, gas, and oil region; flour, planing, cotton mills.
**Independence,** Mo., residential suburb of Kansas City, with stock-breeding and fruit-growing interests; pop. 11,686; scene of 2 Civil War battles; early outfitting point for West, **2273;** Mormons, **2326.**
**Independence Day.** *See in Index* **Fourth of July.**
**Independence Hall,** Philadelphia, **2760–1,** *picture,* **2761;** Liberty Bell, **976.**
**Independents** or **Separatists,** founders of Plymouth Colony, **2937, 2175.**
**Index,** of prohibited books, in Rom. Cath. church, **2918.**
**Index, cephalic** or **cranial, 2956.**
**Index of refraction** or **refractive index,** formula representing the deviation of a ray of refracted light. *See in Index* **Refraction.**
**India,** the central of 3 peninsulas in s. part of Asia; 1,800,000 sq. mi.; pop. 315,000,000; mainly included in the Indian Empire, a Brit. dependency (which also includes Burma); cap. Delhi; **1742–56,** *Study Outline,* **3923,** *maps,* **1744, 1745, 232–3;** animals, **1748;** Arabic numerals, **2543;** caste, **1651, 1750, 3123;** domesticated animals, **1751–2, 527, 1127, 3838,** *picture,* **3524;** foreign trade (*see* names of chief cities and political divisions below); Fr. possessions in, **1756;** government, **1754, 3779;** illiteracy, **1743;** languages, **1748;** literature, **1755–6;** man-eating tiger, **3499;** native states, **1754,** *map,* **1745;** painting and minor arts, **1755;** people, **1748–51, 1651, 540–1;** population, *map,* **232–3;** Portuguese possessions in, **1756;** religions, **1748–9** (*see also* **Buddhism; Hinduism; Mohammedanism; Parsees**); reverence for animals, **525, 1748, 3259, 816, 2291–2,** *picture,* **2290;** sculpture, **1755,** *pictures,* **1749, 1753.**

*Architecture*, **1755**, **4006**; cave temples, **1707**; Great Mosque of Shah Jehan, *picture*, **990**; Hall of the Winds (Jaipur), *picture*, **1742**; Kutb Minar tower, **991**, *picture*, **989**; Mogul structures at Delhi, **990–1**; pagoda at Tanjore, *picture*, **1753**; Taj Mahal, **3429–30**, *picture*, **3431**; tomb of Itimad-ud-daula, *picture*, **1754**; towers of victory, *picture*, **229**.

*Chief cities and political divisions:* Benares, **380–2**; Bengal, **382**; Bombay, **451**; Burma, **540–1**; Calcutta, **573**; Cashmere, **652–3**; Delhi, **989–91**; Hyderabad, **1707**; Lucknow, **2075**; Madras, **2108**, **2110**.

*Geography and industries:* agriculture, **1751**; bananas, **324**, **325**; Cashmere shawls and carpets, **653**; castor oil, **657**; climate, **1746–7**, **3751**, **230**, **1650**; coal, **814**; cotton manufactures, **382**, **451**, **2110**, **3326**, **904**; the Deccan, **1745–6**; ebony, **1073**; elevations, *map*, **232–3**; gems, **1409**, **1410**, **1001**, **1002**, **541**; gold, **1479**; Himalaya Mts., **1649–50**; Hindustan, **1745**; indigo, **1777**; irrigation, **1828**, **1393**, **1778**; jute, **1906**; Khyber Pass, **31**; lac, **1954**; manufactures, **1752** (*see also* under chief cities and political divisions); mica, **2219**; minerals, leading, **1752**; petroleum, **541**; opium, **2584–5**; Punjab, **1745**; railways, **1752**; rainfall, **1747**, *map*, **232–3**; rice, **3013**, **3015**; rivers, **1745**, **1777**, **1393**; rugs, **3079**; sandalwood, **3123**; silk, **3235**; spices, **3317**; sugar, **3385**; tea, **3445–51**, **230**; teak, **3451**; tobacco, **3509**, **3510**; vegetation, **1748**, *map*, **232–3**; wheat, **3732**.

*History*, **1752–4**; Aryan conquest and establishment of Hinduism, **1651**, **1752**; Alexander's invasion, **87**; Tamerlane's partial conquest, **2285**; Mogul empire, **2286**, **1752**; early trade with the West, **1751**, **232**, **904**, **3235**, **3385**; Vasco da Gama and the ocean route, **1392–3**; rise and fall of Fr. power, **1753**; Clive and the conquest of Bengal, **3180**, **573**, **795–6**, **382**; Hastings and establishment of Brit. rule, **1596**; Mutiny of 1857 (Sepoy Rebellion), **1753**, **2075**; end of Company rule, **1754**; Victoria proclaimed empress, **1013**; World War and after, **1754**.

**India, Farther.** Same as **Indo-China.**

**India ink**, **1779**.

**Indiana**, a central state of U.S.; 36,354 sq. mi.; pop. 2,930,390; cap. Indianapolis; **1757–62**; *maps*, **1758**, **3584–5**; agriculture, **1753**; cement, **676**, *picture*, **1761**; chief cities, **1760**, **1762–3**, **1401–2**; coal, **1760**; "corn belt," **888**; dunes, **3122**, *pictures*, **1759**, **3123**; gas, natural, **1760**; limestone, **2945**, **1760**, *picture*, **1761**; literature, **1762**; mfg. industries, **1760**; meaning of name, **3347**; pioneer "log-rolling," **1759**; state flower, **3347**; surface and rivers, **1757–9**. —*History*, **1758–9**, **1762**; George Rogers Clark expedition, **783**; part of Northwest Territory, **2529**; Tecumseh's rebellion, **3451–2**; New Harmony community, **3268**.

**Indian Affairs, Bureau of**, U.S., **3600**.

**Indianapolis**, Ind., cap. and largest city of state; pop. 314,194; **1762–3**, **1760**; Camp Morton, Civil War, **781**; state capitol, *picture*, **1761**; w. end of National Pike, **3024**, **1762**.

**Indian Archipelago** or **Malay Archipelago.** Same as **East Indies.**

**Indiana State University**, at Bloomington, Ind.; co-ed.; opened 1824 as Indiana Seminary (established 1820); languages, science, history, law, medicine, education, etc.; tuition free; **1762**; Maxwell Hall, *picture*, **1761**.

**Indian corn.** *See in Index* **Corn.**

**Indian Empire, Order of the**, **979**.

**Indian millet.** Term loosely given to certain non-saccharine sorghums. *See in Index* **Kafir corn; Millet; Sorghum.**

**Indian Mutiny** (Sepoy Rebellion), of 1857, **1753–4**, **2075**.

**Indian Ocean**, the 3d largest ocean, **1763**, **2553**, *maps*, **232–3**; gigantic waves, **3706**; trade winds, **3750**.

**Indiano'la**, Iowa. Commercial center 18 mi. s. of Des Moines; pop. 3650; Simpson College.

**Indian pipe**, or "ghost flower," a plant, *pictures*, **1382**, **2821**.

**Indian rhinoceros**, **3006**.

**Indians, Central American**, **679**, **1676**, **2505**; Aztec, **288–90**; Las Casas, **1965**; Maya, **3834–5**; probable origin, **2134**.

**Indians, North American**, **1764–76**, **111**; *Study Outline*, **3868**; Alaskan, **77–8**, **1174**; Aztecs, **288–90**; cliff dwellers, **793–4**; Eskimos, **1174–7**; languages, **1768**; mound-builders, **2357**; Pueblo, **2933**; tribal divisions, **1765–8**. *See also in Index* names of tribes and famous chiefs.

*Arts, customs, and beliefs:* basketry, **342–3**, *picture*, **342**; blankets, **202**, **204–6**, **3079**, *picture*, **206**; bows and arrows, *picture*, **1771**; canoes, **446**, *picture*, **442**; carvings, *pictures*, **1766**, **1767**; child life, story, **1775–6**; copper-working, **882–3**; corn the staple crop, **890**; dwellings, **1768**, **1770**, *pictures*, **1764**, **1766**, **1769**, **1770**, **1774**, **793–4**, **844**; hunting and trapping, **1770**, **428**, **430**, **3527**; lacrosse, **1954–5**, *picture*, **1772**; legends, **2059–61**, **2360–2**, **3727–9**, **1250**, **611–5**; personal names, **1776**, **2388**; picture-writing, **3816**; pottery, *pictures*, **1765**, **1769**; religion, **1771**; signaling system, **3454**; snowshoes, **3753–4**; tobacco, **3508**; toboggans, **3756**; totems, *picture*, **74**; wampum, **2281**; water supply, **3702**; position of women, **1768**.

*History and present condition*, **1771–4**, **2576**, **3584**; Apache raids, **2467**; Black Hawk War, **1772**, **3444**; Champlain and Algonquins, **687**; Creek uprising, **1772**; battle of Fallen Timbers and Treaty of Greenville, **3707**; origin of name, **1765**; numbers of population, **2881**, **1774**; probable origin, **2133–4**, **2514**; William Penn's treaty, **2717**; Piutes, **2447–8**; Plymouth colony, **2841**, **1772**; Pontiac's conspiracy, **2226**, **1772**; chief reservations, **1774**, **2576**, **202**, **582**, **2467**, **3296**; in Revolutionary War, **2226–7**; Seminole Wars, **2306**, **3617**, **1773**; Sioux uprisings, **2312**, **2257**, **2432**; in slavery, **1965**, **3249**; Span. exploration, **202**, **892**; Tecumseh, **3452**, **1594**; U.S. citizenship, **768**, **1774**.

**Indians, South American**, **111**, **3288**, types of, *pictures*, **3287**, **2741**; Arawak and Carib, **3622**; Araucanian, **738**; Guarani, **2677**; Incas, **1741**, **2039**, **2814**; prehistoric civilization, **1078**, **449**; probable origin, **2133–4**.

**Indian shot**, or canna, **630–1**.

**Indian Territory**, former territory of U.S., in 1829 reserved for Indians e. of Mississippi R.; since 1907 part of state of Okla.; **2573**, **2576**.

**India paper**, **2673**.

**India-rubber.** *See in Index* **Rubber.**

**Indicative mode**, **3627**.

**In'dic languages**, subdivision of Indo-European group, **2771**.

**In'digo**, **1777**, **1050**; crop of colonial Louisiana, **2068**.

**Indigo bird** or **indigo bunting**, **1241**.

**Indigo snake**, **3260**.

**In'dium**, a rare metallic element, **4042**.

**Indo-China**, the southeasternmost projection of Asia; includes Burma, Siam, and Fr. Indo-China; **1777**, *map*, **232–3**; Burma, **540–1**; Fr. Indo-China, **1777**; Malay Peninsula, **2129–31**; rice-growing, **3015**; Siam, **3226–7**.

**Indo-European languages**, **2771**, **224**, **2956**.

**Indo-European peoples**, **2771**, **224**, **2956**; enter Europe, **1518**, **1520**, **3040**; first to tame horse, **1684**, **3524**.

**Indo-Germanic.** Same as **Indo-European.**

**Indo-Iranian peoples**, **3867**.

**Indore** (*in-dōr'*). A native state of cent. India; 9469 sq. mi.; pop. 1,000,000.

**In'dri**, a Madagascar lemur, **1986**.

**Induc'tance**, electromagnetic induction used as a means of "tuning" radio circuits, or the device used to cause the induction; principle, **3762**.

**Induc'tion**, a method of reasoning, **2772**; Bacon's work, **301**.

**Induction, electromagnetic**, the physical process whereby an electric current of changing value, or a moving magnetic field, creates electric currents in nearby conductors, **1050–2**, **3523**; discovered by Faraday, **1224**, **1050**.

**Induction, electrostatic**, the physical process whereby an electric charge induces charges on nearby bodies, **1118**.

**Induction, magnetic**, the physical process whereby a magnet or an electric current creates magnetism in nearby iron bodies, **2122**, **2123**, **1121**.

**Induction coil**, a device for inducing alternating current from direct; consists of central iron core, a "primary" of heavy wire wound upon the core, a "breaker" for interrupting the primary current, and a "secondary" of fine wire wound over the primary; interruptions in the primary circuit induce an alternating current in the secondary; principle discovered by Faraday, **1121**; relative voltage between coils, **3523**.

**Indul'gences**, in Rom. Cath. church, remission of temporal punishment due to sins, after repentance has removed guilt; Huss attacks granting of, **1705**; Luther, **2085**.

**Indus River**, one of the chief rivers of India; 2000 mi. long; **1777–8**, **1745**.

**Industrial arbitration**, **172–3**.

**Industrial chemistry**, **714**, **10**. *See also in Index* **Chemistry.**

**Industrial education**, **3140–1**, **3654**.

**Industrial expositions**, **1220**.

**Industrial insurance**, **1792**, **1145**.

**Industrial legislation.** *See in Index* **Labor legislation.**

**Industrial Revolution**, **1778**; agriculture revolutionized, **43**, **48**, **1778**; apprentice system ended, **3655**; child labor, **728–9**; effects in England, **1154–5**; factory system, **1218**; labor organizations arise, **1947**; literature affected, **1036**, **2540**; machines introduced, **210**, **652**, **923–4**, **1589**; in Russia, **3088**; in Scotland, **3149**; transportation improved, **2962–3**, **626–7**, **3526**.

**Industrial Workers of the World**, **1947**.

**In'dustries**, chief, of U.S., **3590**. For detailed references on the world's leading industries *see* Study Outline, **4019–23**.

**Inertia** (*in-ēr'shi-ȧ*), defined, **4028**.

**Infallibil'ity**, papal, doctrine of, **2814**.

**Infant.** *See in Index* **Child, care of; Child training**; etc.

**Infan'te** and **Infan'ta.** Titles of Span. royal princes and princesses, respectively.

**In'fantry**, in modern army, **216**; organization (U.S.), *table*, **218**; insignia, *picture*, **3576**.

**Infec'tious diseases**, **1614–5**. *See in Index* **Germ Theory of Disease.**

**Infer'no,** in Dante's 'Divine Comedy', **960.**
**Infin'itive, 3628.**
**Inflected languages, 2771.**
**Inflec'tion,** characterizes Indo-European languages, **2771;** declension, **2537, 2921–2;** conjugation, **3627–8.**
**Influen'za,** caused by bacteria, **1450;** theory of serum treatment, **151–2.**
**Infra-red rays, 1998;** place in spectrum, **3312.**
**Infuso'ria, 2927, 3944.**
**Infusorial earth.** Same as **Kieselguhr.**
**In'galls, John James** (1833–1900). Amer. politician, b. Middleton, Mass.; U.S. senator from Kan. (1873–91); brilliant speaker; excellent parliamentarian.
**Ingelow** (*in'jē-lō*), **Jean** (1820–97). Eng. poet and novelist, remarkably popular in her time, though little of her work is still read ('High Tide on the Coast of Lincolnshire'; 'Songs of Seven').
**In'gersoll, Robert Green** (1833–99). Amer. lawyer, author, and orator, b. Dresden, N.Y.; served in Civil War; atty.-gen. of Ill. 1867; gained national fame as orator by "plumed knight" speech nominating Blaine for president in 1876; chiefly remembered for his lectures and books violently assailing the Bible and Christianity.
**Ingle, Richard,** Eng. seaman of 17th cent.; seizes govt. in Md., **2163.**
**In'goldsby, Thomas.** Pen name under which the Eng. humorist, Reverend Richard H. Barham (1788–1845), wrote the whimsical 'Ingoldsby Legends'.
**Ingolstadt** (*ing'ōl-shtät*), Germany. Fortified town on Danube R. 45 mi. n. of Munich; pop. 26,000; guns, soap, brushes.
**In'got,** a mass of cast metal, *pictures,* **1820, 1821.**
**Ingrain carpeting, 3079.**
**Ingres** (*ăⁿ'gr*), **Jean August Dominique** (1780–1867). Fr. portrait and historical painter, leader of classical school, in constant competition with Delacroix, leader of Romantic school; wonderful draftsmanship ('Apotheosis of Homer'; 'Stratonice').
**Inheritance tax, 3441.**
**Ini'tiative, referendum, and recall, 1778–9.**
**Injunction.** A writ issued by a court of equity ordering a person or persons to do or not to do a certain thing; issued only when ordinary legal procedure is inadequate; restrains from continuing nuisances, etc.; also issued to safeguard property and business of employers from violence of strikers.
**Ink, 1779–80;** logwood dyes, **2047;** secret, or sympathetic, **1779, 816.**
**Ink'erman,** Russia. Seaport village in s. Crimea, near e. extermity of the harbor of Sebastopol, where English and French in 1854 defeated Russians in Crimean War.
**Inman Line** of steamships. **3212.**
**'In Memo'riam',** poem by Tennyson, **3470.**
**Inn,** r. rising in e. Switzerland, one of chief tributaries of Danube; 320 mi. long; **3414,** *maps,* **3415.**
**Inner Mongolia,** the e. part of Mongolia, **2285.**
**In'ness, George** (1825–94), one of greatest of Amer. landscape painters, b. Newburg, N.Y.; distinguished for beautiful coloring and poetical feeling; **2634;** 'Autumn Oaks', *picture,* **2637.**
**Inniskil'ling.** Same as **Enniskillen.**
**In'nocent,** popes. For list *see in Index* **Pope.**
**Innocent I** (d. 417), pope, **1780.**
**Innocent II** (d. 1143), pope, **1780.**
**Innocent III** (1161–1216), pope, **1780;** aids Otto IV, **2606;** conflict with King John of England, **1896;** and St. Francis, **1355.**
**Innocent VII** (1336–1406), pope, **1780.**
**Innocent VIII** (1432–92), pope, **1780.**
**Innocent X** (1574–1655), pope, **1780.**
**Innocent XI** (1611–89), pope, **1780.**
**Innocent XII** (1615–1700), pope, **1780.**
**Innsbruck** (*ins'pruk*), historic and picturesque city on Inn R.; cap. of Tyrol, Austria; pop. 60,000; univ.; cotton and wool weaving; glass and mosaic work; **3573.**
**Innuits** (*in'yu-its*), or Eskimos, **1174.**
**Inocula'tion,** in medicine, **151–2, 3613, 1450, 1452.**
**Inorgan'ic chemistry, 714.**
**Inouye** (*ē-nu'yā*), **Kaoru, Marquis** (1835–1915). Japanese statesman, a leader in reform movement which culminated in Revolution of 1867; for 30 years, while he held various Cabinet positions, no great issue in finance or foreign affairs settled without his advice.
**In'quest,** a judicial inquiry; early form, **1905;** coroner's, **1904,**
**In'quiline,** an insect which lays eggs in nest of another insect, thus living as a parasite; bees, **364.**
**Inquisi'tion,** in the Rom. Cath. church, **1780, 1832;** Galileo forced to recant, **1392;** under Philip II, **3304, 2763, 3302.**
**Insala,** town on n.w. border of the Sahara; pop. 2837; occupied 1900 by the French; **3105.**
**Inscrip'tion Rock,** in N.M., **2467.**
**Insecta.** Scientific name for insect or hexapod (six-legged) class of arthropods. *See in Index* **Insects.**
**Insec'ticide, 3330–1.**
**Insectiv'ora,** an order of insect-eating mammals, **2132;** in N. Amer., **2278–9.**
**In'sects,** the six-legged arthropod animals, **1781–91, 3946;** breathing, **2998;** caterpillars, **660–2;** disease-spreading types, **1450, 1452, 1292, 1312, 2334–8;** eaten by birds, **401–2, 408, 3308;** egg forms and hatching, **1090,** *pictures,* **1091;** evolutionary position, *diagram,* **128;** Fabre's work, **1217–8;** injure forests, **1328;** killed by spraying, **3330;** larvae, **1964, 660–2;** metamorphosis, **1964, 2936, 660–2;** parasites check, **2680;** pollen carriers, **1304, 1310, 809;** protective coloration, **2924;** pupae, **2936;** spiders not insects, **3326.** *See also in Index* the principal insects, as **Aphids; Ants;** etc.; and insect orders, as **Beetles,** by name.
**Insects, beneficial and harmful, 1788;** aphids, **154;** army-worm, **218–9;** bees, **362, 363;** beetle pests, **369–70;** butterflies, moths, and caterpillars, **548, 661;** cankerworms, **630;** cicadas, **765;** chinch bugs, **752;** cochineal yields dyes, **817;** codlin moth, **820;** cutworms, **944;** damage forests, **1328;** grasshoppers and locusts, **1503–6;** Hessian fly, **1645;** potato-bug, **2902;** scale insects, **3132–3, 2680;** silkworm, **3234–8, 3240;** spraying, **3330–1;** wasps prey on other insects, **3691, 3693;** weevils, **3713.**
**Insect-trapping plants.** *See in Index* **Carnivorous plants.**
**Insig'nia,** in U.S. Army and Navy, **3578–9,** *pictures,* **3576, 3577.** *See also in Index* **Decorations of Honor.**
**Inspec'tor General's department** (U.S. Army), **218;** insignia, **3576.**
**Instep** of the foot, **1322, 1324.**
**In'stinct,** in man, **2930;** in animals, **130–1.** *See also in Index* **Beaver; Bee; Birds;** etc.
**In'stitute of France, 4.**
**Institutes,** of Justinian, **1905.**
**In'sular Affairs, Bureau of,** U.S., **3599.**
**In'sulators, electric,** substances which do not conduct electricity, **1110, 3758;** cables, **556, 557;** cellulose acetate and "synthetic plastics," **673;** gutta-percha and substitutes, **1554;** mica, **2219.**
**Insur'ance, 1791–2;** employers' liability, **1145.**
**Intaglio** (*in-täl'yō*), an incised carving or sunk design, **3154;** distinguished from cameo, **591;** in printing, **1168, 1172.**
**"Intellectual capital of the world," 1348.**
**Intel'ligence,** in man, **2797, 2930, 486–91;** in other animals, **130–1.**
**Intelligence tests, 1792–3;** in education, **2931.**
**In'terdict, church,** defined, **764;** England, **1896.**
**Interest,** how to figure, **2724–6;** on bonds, **3359;** on savings accounts, **327.**
**Interest,** in economics, **1077.**
**Interest,** in education, related to apperception, **160.**
**Interfer'ence of light, 1998.**
**Interferom'eter, 1998.**
**Inte'rior, Department of,** U.S., **3597, 3600–1;** Bureau of Education, **1086;** Bureau of Mines, **2250–1;** Bureau of Pensions, **2722;** controls Indian affairs, **1774, 3600;** Geologic Survey, **3600–1;** national parks, **2399;** Patent Office, **2692, 2694;** Reclamation Service, **1829;** General Land Office, **1960.**
**Interjec'tion,** in grammar, **1493.**
**Interlaken** (*in-tēr-lä'kĕn*) ("betwcen the lakes"), Switzerland, popular pleasure resort in Alps between Lakes Thun and Brienz, 25 mi. s.e. of Bern; starting point for excursions to Lauterbrunnen and the Jungfrau; **102.**
**Interlocking directorates, 3546.**
**Interlocking plants,** on railroads, **2969.**
**Intern** (*in-tērn'*) or **interne, 1688.**
**Internal combustion engine.** *See in Index* **Gas engine.**
**Internal improvements,** in U.S., **627, 3024–7;** Benton, **384;** Calhoun, **575;** in Clay's "American system," **785;** in N.Y., **2484–5;** Polk's policy, **2872.**
**Internal Revenue, Bureau of,** U.S., **3598.**
**Internal revenue taxes, 3441.**
**Interna'tional, The** (in full, The International Working Men's Association), name of three different socialist organizations, of varying degrees of radicalism, which asserted the rights of labor as a world class and aimed ultimately to give it political control by international action. War was considered an instrument of capital for oppression of labor, but when the World War came the International broke down, and the majority of the Socialists of the European countries supported their governments instead of their class; First International, **3268.**
**International code,** in signaling, **3233;** in telegraphy, **3456.**
**International Council of Women, 3779.**
**International date line, 3501,** *map,* **2624–5.**
**International law,** sources and scope, **1794;** blockade, **437;** diplomatic privileges, **1012, 1013;** naturalization, **2405;** piracy, **2810;** privateering, **2810;** Hague regulations for warfare, **1559;** violated in World War, **3791, 3378, 1408.**
**International News Service, 2475.**
**International pitch,** in music, **3278.**
**International Postal Union, 2898.**
**International Woman Suffrage Alliance, 3779.**
**International Working Men's Association, 3268.** *See in Index* **International, The.**
**Interreg'num, Great.** In Ger. history, the interval (1256–73) between the fall of the Hohenstau-

fen emperors and the election of the first Hapsburg.
**Interstate Commerce Commission,** 1794, 791, 2971; employs engineers, 1149; powers increased, 3060.
**Interur'ban railways,** 3372.
**Intes'tines,** digestive fluids and processes in, 1010, 1011, *picture-diagram,* 2794.
**Intran'sitive verb,** 3627.
**Introduc'tions,** etiquette of, 1184–5.
**Invalides** (*ăn-vă-lēd'*), **Hotel des,** Paris, 2684.
**Invar',** a hard alloy, 2507; use in pendulum, 2715; in surveying tapes, 3398.
**Inventions,** 1795–1802; Industrial Revolution, 1778, 1218, 43–4; patents, 2692, 2694; U.S. leads world in, 2694; world's greatest, 1801–2, 773–4.
**Inverness** (*ĭn-vēr-nĕs'*). Chief city of n. Scotland, seaport and resort on n.e. coast on Ness R.; pop. 22,000; cap. of Inverness-shire, largest Scotch county; anc. stronghold of Picts.
**Inver'tebrates,** 3634.
**Inverted image,** 1987, 2778–9, *picture,* 1988; in eye, 1214, *picture,* 1216.
**Invert sugar,** 3388, 3389.
**Inves'titure, feudal,** 1236.
**Investiture conflict,** in Germany, 1632–3, 1541; in England, 3740.
**Invisible spectrum,** 3312.
**Io** (*ī'ō*), in Gk. myth., maiden loved by Zeus and changed into a heifer, 1802, 468.
**I'odine,** a chemical element, 1802; compared with other halogens, 755; nitrogen iodide an explosive, 1211, 1212; obtained from seaweed, 3171.
**Io'doform,** an antiseptic, 1802, 151.
**I'on,** an electrically charged atom, molecule, or unified group of molecules in a gas or liquid medium; in electrolysis, 1125.
**Iona** (*ī-ō'nă*) or **Icolmkill,** one of Inner Hebrides; 5 sq. mi.; center of Celtic Christianity, 1625.
**Io'nia,** in anc. geography, a dist. on the w. coast of Asia Minor and adjacent isls., settled by the Ionian Greeks; *map,* 1518.
**Ionian Islands,** group of 7 isls. in Ionian Sea off w. coast of Greece; *map,* 308; ceded to Greece, 1526.
**Ionians,** one of the four great branches of the Gk. people, 1520.
**Ionian Sea,** the part of the Mediterranean between Greece and s. Italy; *map,* 308.
**Ionic** (*ī-ŏn'ĭk*) **dialect,** 1538.
**Ionic order,** in architecture, 177, *picture,* 180.
**"I only regret that I have but one life to lose for my country,"** 1565.
**I'owa,** a n.-cent. state of U.S., the leading corn state of the Union; 56,147 sq. mi.; pop. 2,404,021; 1803–6, *maps,* 1804, 3584–5; capitol, 999, 911; climate, 1806; cap., Des Moines, 998–9; education, 1804; history, 1806; mfg. and other industries, 1804, 1806; meaning of name, 1806; natural wealth and farm products, 1803; state flower, 3347.
**Iowa, State University of,** at Iowa City; co-ed.; opened 1847; liberal arts, commerce, law, medicine, dentistry, pharmacy, applied science, education; physics building, *picture,* 1805.
**Iowa City,** Iowa. Industrial city 50 mi. w. of Davenport on Iowa R.; pop. 11,267; flour, iron, woolen goods, perfumery, gloves; stock-raising and meat-packing interests; state univ.
**Iowa Indians.** Tribe of Siouan stock; originally living in Minnesota; moved s. and later settled on Kan. and Okla. reservations.
**Iowa River,** in Iowa; flows 350 mi. s.e. to Mississippi; gorge, *picture,* 1806.
**Iowa State College of Agriculture and Mechanic Arts.** At Ames, Iowa; co-ed.; founded 1868; agriculture, engineering, home economics, industrial science, veterinary medicine.
**Iowa State Teachers' College.** At Cedar Falls, Iowa; co-ed.; founded 1876; teachers' training for primary, secondary, and high schools.
**Iowa Wesleyan College.** At Mt. Pleasant, Iowa; co-ed.; founded 1842 under Meth. Episc. church; liberal arts, music, commercial and normal work.
**Ipecac,** So. Amer. plant of the madder family; used as an emetic, 2855.
**Iphigenia** (*ĭf-ĭ-jĕ-nī'ă*), in Gk. myth., daughter of Agamemnon, offered as a sacrifice in Trojan War, 3543.
**Iphitus** (*ĭf'ī-tŭs*), in Gk. myth., friend of Hercules, 1640.
**"I pledge allegiance to my Flag,"** 116.
**"I propose to fight it out on this line if it takes all summer,"** 779.
**Ips'wich,** England, port and mfg. town on Orwell estuary, 64 mi. n.e. of London; pop. 81,000; cap. of Suffolk; cheese fair, 1220.
**Iquique** (*ē-kē'kā*). One of leading ports of Chile, in extreme n.; pop. 48,000; exports nitrate.
**Iquitos** (*ē-kē'tōs*), trade center of n.e. Peru on Amazon R., at head of navigation for ocean vessels, 2500 mi. from mouth; pop. 12,000; 2744.
**Iran** (*ē-rän'*). The official native name for Persia.
**Iranian** (*ī-rā'nĭ-ăn*) **Plateau,** or **Iran,** high tableland including Afghanistan, Persia, and Baluchistan, 2733–4.
**Iran'ic languages,** 2771.
**Iraq** (*ē-räk'*) or **Irak.** An Arab kingdom, including most of Mesopotamia, provisionally established under Brit. auspices in 1921 with cap. at Bagdad.
**Irawadi River.** Same as **Irrawaddy.**
**Irazu** (*ē-rä'-sų'*), **Mt.,** Costa Rica, volcano near Cartago (11,200 ft.), 896.
**Ireland, John** (1838–1918). Irish-Amer. Rom. Cath. prelate, archbishop of St. Paul, Minn.
**Ireland,** the smaller of the two main British Isles; 32,531 sq. mi.; pop. 4,390,219; 1807–11, *maps,* 1152, 1159, 1196–7; agriculture, 1807, 1808; chief cities and industries, 1807–8, 371, 888, 1043; clans, 1224; emigration to U.S., 1810, 1738, 3587; flax, 1292, *picture,* 1291; folklore, 1219, 1814; Gaelic language, 1814, 674; in Ice Age, 1720; lacemaking, 1949, 1950, 674; linen thread industry, 3493; literature, 1814, 674, 1036, 1038; peat cutting, *picture,* 2705; people, 1807, 674; potato growing, 2900; shamrock the emblem, 3195; story, 'The Fairy Calf of Tipperary', 1812–4.
*History,* 1808, 1810–1; Christianity established, 2694–5, 2299; Eng. conquest, 1808; rebellion of 1641 and Cromwell's reconquest, 1808, 924; battle of the Boyne, 1810, 1861; union with Gt. Brit. (1801), 1510, 1810, 2559; Cath. Emancipation Act, 2559, 2706; Home Rule movement, 1811, 2559, 2689–90, 1468, 371; great famine and repeal of corn laws, 1810, 2706, 1468; church disestablished, 1468; land acts, 1468, 2689, 476; Sinn Fein, 1811, 888; Dublin Easter Revolt, 1043, 1811; separate parliaments established for Ulster and the Irish Free State, 1811.
**Ireland Island,** 386.
**Irenaeus** (*ī-rĕ-nē'ŭs*), **Saint** (d. 202 A.D.). A Gk. church father and martyr, bishop of Lyons.
**Irene** (752?–803 A.D.). Byzantine empress, first woman to rule Eastern Empire; originally a poor orphan, seized power in 780, on death of her husband, Leo IV; blinded and later murdered her son, Constantine VI; planned to unite Eastern and Western Empires by marrying Charlemagne; deposed (802) and exiled.
**Irides'cence,** rainbow-like play of colors; how caused in shells, 3201.
**Irid'ium,** a silver-white, hard, brittle metallic element, belonging to the platinum group; alloys of, 853, 2710, 2831–2; found in the Urals, 3607.
**I'ris,** in Gk. myth., rainbow goddess, messenger of gods, 1814, 2972.
**Iris,** of the eye, 1213, *pictures,* 1214.
**Iris,** a flower, 1814; structure of tuber, 532.
**Iris family** of flowers, the *Iridaceae,* 3940.
**Irish elk,** 2325.
**Irish Free State,** established, 1811.
**Irish harp,** 1589, *picture,* 1590.
**Irish Home Rule.** *See in Index* **Home Rule.**
**Irish lace,** 1950.
**Irish Land Acts,** 1468, 2689, 476.
**Irish Land League,** 476, 2689.
**Irish language,** 1814, 674.
**Irish literature,** 1814, 674; drama, 1036, 1038.
**'Irish Melodies',** songs by Thomas Moore, 1814.
**Irish mile,** 3715.
**Irish moss,** or carragecn, a seaweed used for food, 3171, 1409, 2340, *picture,* 3170.
**Irish** or **white potato,** 2901.
**Irish Sea,** body of water between England and Ireland, with North Channel at n. and St. George's at s., *map,* 1159.
**Irish terrier,** 1023, *picture,* 1021.
**Irish wolf dog,** 1023.
**Irkutsk** (*ĭr-kŭtsk'*), trade center and largest city of Siberia, near Chinese border and near s. end of L. Baikal; pop. 130,000; on Trans-Siberian r.r.; 3229.
**Iron, Ralph.** *See in Index* **Schreiner, Olive.**
**Iron,** 1816–7, 1820, 1824; comparative abundance, 711, *picture,* 1058; contained in protoplasm, 394; cyanides, 944; disulphide (pyrites), 3390, 1817; early use, 1816–7, 773; essential for plant growth, *picture,* 2821; in human body, 2792; magnetic properties, 2121–3; meteoric, 2202, 2204; ores, 1817; oxide (rust), 1816, 3098–9, 2643, 105; used as money, 2281. —*Geographical distribution,* 1817, 1820; Africa, 41; Australia, 264; Brazil, 494; Canada, 610, 640; China, 744, 1575, 3195; Czecho-Slovakia, 947, 270; Europe, 1820; France, 1348, 1820; Germany, 1443, 1820, 1178; Gt. Brit., 1158, 1160, 3664; Mexico, 2210–1; Poland, 2857; Russia, 3086; Spain, 3301, 3302; Sweden, 3403–4; U.S., 3590, 2254.
**Iron, galvanized,** 1120, 3839, 3099.
**Iron Age,** the 3d and highest period of barbarism, 772–3.
**Iron and steel,** 1815–26; alloys, 99, 2135, 2507, 2831, 3548; aluminum prevents blowholes in ingots, 105; armor-plate, 216; Belgium, 374, 1995; cast iron, 1824; characteristics of iron, 1816, 1824, of steel, 1824, 3352; China, 1575, 3195; Czecho-Slovakia, 947, 270; first used for ships, 3212; France, 1348, 1820; furnaces, various types of, 1382; Germany, 1443, 1820, 1826, *picture,* 1444; Gt. Brit., 1158, 1160, 1820, 1826, 427, 3200; "high polish" iron, 220; how welded, 3716, 105; importance in modern life, 1815, *picture,* 1825; Japan, 1866, 1867; mfg. processes, 1818–24, 1826; oxyacetylene cutting, 7; rails,

*pictures*, **1822–3**; rusting, **3098–9**; tools, **3514–6**. —*U.S.* **1826, 3590**; Ala., **70, 426–7**; Conn., **866**; Gt. Lakes transportation, **1512, 1513**, *map*, **1511**; Ill., **1733, 1736**; Ind., **1760, 1401**; Ohio, **2570, 3832–3**; Pa., **2720, 2762, 2813**; Va., **3650**.
**Iron boot**, instrument of torture, *picture*, **2919**.
**Ironclads**, armored vessels. *See in Index* **Navy**.
**Iron Cross**, Ger. military decoration, **979**, *picture*, **977**.
**Iron crown of Lombardy, 2047, 2235**; worn by Napoleon, **2395**.
**Iron Gates**, point in Danube R. between Rumania and Jugo-Slavia nearly barricaded by mts., **962, 1190**.
**Ironing**, with electric flat-iron, *picture*, **1115**; by machinery, **1969**.
**Iron Maiden**, instrument of torture, *picture*, **2919**.
**Iron Mask, Man in the, 1827**.
**Iron Mountain**, Mich. Iron mining and shipping city in n. peninsula on Menominee R.; pop. 8251.
**Iron Mountain**, in Mo., hill 1077 ft. high, **2270**.
**Iron ores, 1817, 1820**.
**Iron pyri'tes**, or "fool's gold," **1817, 3390, 1479**.
**"Ironsides,"** Cromwell's regiment, **924**.
**'Ironsides, Old', 2423**.
**Ironton**, Ohio, industrial city 100 mi. s. of Columbus on Ohio R.; pop. 14,007; clay, iron ore, and bituminous coal region; iron and cement products, **2570**.
**Ironwood**, Mich. City in famous Gogebic iron region, 12 mi. s. of L. Superior; pop. 15,739; trade center for mining and lumber interests.
**Ironwood**, popular name for several kinds of trees, especially certain hornbeams and buckthorns, whose timber is very hard; in Borneo, **468**.
**Iroquois** (*ir-ō-kwoi'*) **Indians**, or **Five Nations**, confederacy of N. Amer. Indians formerly living in cent. and w. N.Y., **1766**; allies of English, **1772, 2486**; hostile to French, **687, 1375, 1514**; Hiawatha legends, **2057, 2059–61**; houses, **1770**; women's combs, *picture*, **1767**.
**Irrawaddy** (*ir-ä-wä'di*) or **Irawadi**, chief river of Burma; rises in n., flows s. 1500 mi. to Bay of Bengal; large delta; **540, 541**; rice growing, **3015**.
**Irregular verbs, 3628**.
**Irrigation and reclamation, 1827–30**; artesian wells used, **222**; in Australia, **262**; in China, **744, 3013, 3015**; in Egypt, **1092, 1096, 1098**, *picture*, **1093**; eucalyptus trees in swamps, **1186–7**; France, **3122**; India, **1393**; Italy, **1838–9**; Japan, **3013, 3015**; Mesopotamia, **2200–1, 1187, 295, 296**; Palestine, **2645**; Persia, **2735**; S. Africa, **3283**; Spain, **3302, 3614**; Turkestan, **3556**. —*In U.S.*, **3588, 3600**; Ariz., **202**, *pictures*, **200, 1830**; Calif., **578, 581**; Colo., **840**, *pictures*, **842**; Fla., **1300**; Idaho, **1726–7**; Kan., **1909**, *picture*, **1910**; Mont., **2310**; Neb., **2429–30**; Nev., **2444**, *picture*, **1829**; N.M., **2465–6, 3022**, *picture*, **2464**; S.D., **3294**, *picture*, **3295**; Tex., **3476, 1139**; Utah, **3609, 3610**; Wash., **3687**, *pictures*, **2688, 1828**; Wyo., **3820, 954**.
**Irritant poisons, 2855**.
**Irving** (*ēr'ving*). **Sir Henry** (1838–1905). Famous Eng. Shakespearean actor-manager long associated with Ellen Terry; first Eng. actor knighted; Hamlet, Macbeth, Othello, Shylock, King Lear, were favorite parts.
**Irving, Washington** (1783–1859). Amer. essayist, historian, and story-writer, **1830–1, 112, 1178**.
**Ir'vington**, N.J. Residential suburb of Newark, adjoining it on s.w.; pop. 25,480; smelters, foundries, tannery, wall paper and linoleum factories.
**Isaac** (*ī'zȧk*), Hebrew patriarch, son of Abraham, and father of Jacob and Esau, **3, 1889**; burial place, **2644**; meaning of name, **2388**.
**Isaac I, Comne'nus** (d. 1061). Byzantine emperor from 1057 to 1059, first of the Comneni line; reformed taxation and effected economies.
**Isabel'la of France** (1292–1358), queen of Edward II of England and daughter of Philip IV of France, **1088**.
**Isabella of Castile** (1451–1504), **1832**; aids Columbus, **848**; and Cardinal Ximenes, **3823**. *See also in Index* **Ferdinand II of Aragon**.
**Isabella II** (1830–1904). Queen of Spain; succeeded 1833; forced to abdicate 1870; mother of Alfonso XII.
**Isabey** (*ē-zä-bā'*), **Jean Baptiste** (1767–1855). Fr. portrait painter; pupil of David; became court painter ('Review of Troops by the First Consul').
**Isaiah** (*ī-zā'yȧ*) (8th cent. B.C.), one of greatest of Old Testament Hebrew prophets; gives name to 23d book of Old Testament; **2922**; meaning of name, **2388**.
**Isar** (*ē'zär*) **River**, rises in Tyrolese Alps in s. Bavaria, flows n.e. 219 mi. to Danube; total fall 4816 ft.; **1442**.
**Ischia** (*is'kĭ-ä*). Volcanic isl. of Italy 16 mi. s.w. of Naples; 26 sq. mi.; pop. 28,000.
**Ischl** (*ĭshl*), Austria. Celebrated resort, 28 mi. s.e. of Salzburg; pop. 30,000; formerly summer residence of Austrian imperial family.
**Iseo** (*ē-zā'ō*), **Lake of**, in n. Italy at s. foot of Alps, 15 mi. n.w. of Brescia; formed by Oglio R.; 24 sq. mi.; **1835**.
**Isère** (*ē-sêr'*) **River**, rises in Alps in s.e. France and flows s.w. 180 mi., **3012**.
**Iserlohn** (*ē-zĕr-lōn'*), Germany, mfg. city in Westphalia; pop. 30,000; needles, bronze, and brass ware; **1443**.
**Iseult** (*ē-sụlt'*), **Yseult**, or **Isolde**. Heroine of medieval romance 'Tristan and Iseult'. *See also in Index* **Tristan**.
**Isfahan**, Persia. Same as **Ispahan**.
**Ishmael** (*ĭsh'mā-ĕl*), son of Abraham and Hagar, Sarah's Egypt. handmaid; ancestor of Ishmaelites (Arabs, according to Arab tradition); driven out with his mother and grew up in the wilderness; **3**.
**Ish'peming**, Mich. Iron-mining center, 11 mi. w. of Marquette in great L. Superior mineral region; pop. 10,500; also gold, marble, and building stone near by; lumber mills.
**Ish'tar**. Chief goddess of Babylonia and Assyria, corresponding to Phoenician Astarte and Gk. Aphrodite; the "Great Mother," goddess of fertility, of love, and of war.
**Isinglass** (*ī'zĭn-glȧs*), **1832, 1409**.
**Isis** (*ī'sis*), chief goddess in Egypt. myth., **1832, 2602, 1106**.
**Isis, Temple of**, at Philae, **1107**, *picture*, **1106**.
**Is'lam**. Arabic word meaning "pious submission to the will of God"; another name for Mohammedanism, and therefore for the whole group of Mohammedan peoples.
**Island Number Ten**. Isl. in Mississippi R. near n.w. Tenn., captured April 1862 by Federal army under Pope and gunboats under Foote; washed away by river after war.
**Island Range**, partially submerged mountains whose peaks form islands off Brit. Columbia coast; **510, 512**.
**Islands**, origin of, **2788**; coral, **884–6, 2621**, *picture*, **2789**; volcanic, **3658, 2622, 1601**.

WORLD'S LARGEST ISLANDS

| | AREA IN SQ. MI. |
|---|---|
| Greenland, est. from | 512,000 to 825,000 |
| New Guinea | 300,000 |
| Borneo | 290,000 |
| Madagascar | 228,000 |
| Sumatra | 167,000 |
| Great Britain | 88,210 |
| Honshu | 86,953 |
| Celebes | 72,000 |
| New Zealand, (South Island) | 58,120 |
| Java | 50,557 |

**Is'lay**, southernmost isl. of Inner Hebrides, Scotland; 24 sq. mi.; **1625**.
**Isle of Pines**. *See in Index* **Pines, Isle of**.
**Isle Royale**, largest isl. in L. Superior, **2226, 3397**.
**Isles of the Blest** or **Fortunate Isles, 628**.
**Isleta** (*ēs-lā'tä*) or **Ysleta**, Tex., village on Rio Grande, 12 mi. s.e. of El Paso, **3477, 3478**.
**Is'lington**. Metropolitan borough of n. London, England; pop. 330,000.
**Isly** (*ēz-lē'*). Small river in Morocco near Algerian border, in 1844 scene of greatest Fr. victory in Algerian wars.
**Ismail** (*ēs-mä-ēl'*) (1830–95). Khedive of Egypt, son of Ibrahim Pasha; succeeded his uncle Said as viceroy 1863; by aiding the Sultan of Turkey secured direct succession of his line and title of khedive; improved economic condition of Egyptians, but destroyed national credit and brought about intervention of England and France; deposed 1879.
**Ismail** or **Izmail**, Rumania. Port on Kilia branch of Danube delta; pop. 86,000; flour mills, tannery, brickyards, potteries.
**I'sobars**, defined, **3708**.
**Isoch'ronism**, of pendulum, **2715**.
**Isocrates** (*ī-sŏk'rȧ-tēz*) (436–338 B.C.), Athenian orator and patriot; "the old man eloquent" who preached Gk. union to conquer Persia and was killed, according to Milton, by report of "that dishonest victory at Chaeronea, fatal to liberty"; **1537**.
**Is'olating languages, 2771**.
**Isolde**. Same as **Iseult**.
**Isonzo** (*ē-zŏn'zō*) **River**, in n.e. Italy (formerly in Austria), rises in Alps and flows s. 75 mi. to Gulf of Trieste; in World War, **3795, 3797, 3810**.
**Isop'tera**, an order of insects, **1788**.
**I'sotherms, 3708, 795**.
**Ispahan** (*ēs-pä-hän'*) or **Isfahan**, city of Persia, near center; pop. 80,000; in 17th cent. was cap. of Persia, had pop. of nearly a million, and was great market of Asia; **2734**; prayer rug, color plate facing **3077**.
**"I Spy,"** game, **2836**.
**Israel** (*ĭz'rȧ-ĕl*), name borne by the Hebrew patriarch Jacob, and by the 12 tribes descended from him, **1889**. For history of the kingdom of Israel *see in Index* **Jews**.
**Israels, Josef** (1824–1911). Dutch genre painter, the Millet of the fisher folk ('Toilers of the Sea').
**Issachar** (*is'ȧ-kär*). Son of the patriarch Jacob, ancestor of the tribe of Issachar.
**Issus** (*is'sŭs*), anc. seaport in s.e. Asia Minor, of great strategi importance because of its location on the pass leading from Syria into Cilicia; battle of (333 B.C.), **86, 2738**.
**Is'tria**, Ital. district comprising peninsula in n. Adriatic Sea and adjacent Quarnero Isls.; chief city Trieste; acquired by Italy, **1286, 1840**.

**Itagaki** (*ē-tä-gä'kē*), **Taisuke, Count** (1837–1919). The "Rousseau of Japan"; helped overthrow feudalism; established school to teach principles of govt. to the people; advocated constitutional govt. and founded first political party in Japan.
**Italia Irredenta** (*ĭ-tä'lĭ-ä ĭr-ĕ-dĕn'-ta*), "unredeemed Italy," **3539, 3540.**
**Italian chestnut, 719.**
**Italian language, 1832, 2771;** origin, **3040;** number of people speaking, **2772;** in Switzerland, **3415;** Tuscan dialect, **1832, 1839.**
**Italian literature, 1832–3;** chief writers and their works, **1833, 1038;** Dante's influence, **958;** novel, **2541;** Renaissance, **2995–6.**
**Italian mile, 3715.**
**Italian Somaliland** (*sō-mä'lē-lănd*), colony and protectorate of n.e. African coast extending from Gulf of Aden to Juba R.; 139,430 sq. mi.; pop. 650,000; **40, 41,** *map,* **40–1;** natives, **37.**
**Italic languages,** defined, **2771.**
**It'aly,** kingdom in s. Europe; 123,000 sq. mi.; pop. 37,000,000; cap. Rome; **1834–53,** *maps,* **1836, 1196–7;** *Study Outline,* **3911;** Christmas customs, **759;** colonies, **1835;** decorations of honor, **979;** education, **1839;** earthquakes, **1066, 3230;** emigration to U.S., **1840, 1738;** government, **1838, 555;** national debt, **2399;** national songs, **2405;** syndicalism, **1947.**
*Art,* **1843–53,** *pictures,* **1204–5;** architecture, **1843–52, 180–1,** *pictures,* **182, 184, 187** (*see also in Index* **Cathedrals, famous**); music, **2378, 2584;** painting, **2629–30;** pottery, **2906;** Renaissance period, **2996–7;** sculpture, **3156–8;** Vatican, **1201–2, 3054–5.** *See also in Index* **Roman art,** and names of chief cities and artists.
*Geography and industries:* agriculture, **1838–9, 1840–1;** cap. Rome, **3049–58;** chief cities and products, **1835, 1840** (*see also* under names of cities); climate, **1835, 3751;** fisheries, **2194, 886, 3126, 3230;** foreign trade, **1412, 2390, 3230;** laces, **1949, 1950;** Lombardy, **1190, 1840, 2047;** marble, **2144, 2945;** minerals, **154, 3126, 3389;** mountains, **101–2, 154;** olive industry, **2579–80;** population, *map,* **1190–1;** rainfall, *map,* **1190–1;** rivers, **1835, 154, 2848, 3494;** San Marino, **1842;** Sardinia, **3126–7;** shipping, **3219;** Sicily, **3229–30;** silk, **3235, 3236;** surface, **1835,** *map,* **1190–1;** Tyrol, **3573–4;** vegetation, *map,* **1190–1.**
*History* (medieval and modern), **1836–8, 1840, 1842;** chief events summarized, **1658–60;** barbarian invasions, **1195, 1491–2, 1704, 2047;** development of monasticism, **2299;** under Charlemagne, **688–9;** Norman invasions, **2513, 2391, 3230;** in Holy Roman Empire, **1675** (*see in Index* **Holy Roman Empire; Papacy**); under Frederick I, **1358;** Guelfs and Ghibellines, **1546, 1293, 958;** rise of cities, **770** (*see also* under names of cities); Two Sicilies under Frederick II, **2391, 3230;** Renaissance in, **2995–7, 1293–4, 3156–8** (*see also in Index* **Renaissance**); development of postal system, **2896;** wars with France, **696, 1354;** in Napoleonic era, **2392–3, 2394, 2395.** —*Unification and recent events,* **1837–8, 1840, 1294;** Cavour, **670;** Garibaldi, **1399;** Mazzini, **2178;** conflict with papacy, **2813–4;** under Victor Emmanuel II, **3638;** Mafia controversy with U.S. (1891), **1593, 2471;** acquires colonies in Africa, **40, 3541, 3;** in Triple Alliance, **1196;** Balkan policy, **310;** war with Turkey, **1196, 3541;** World War and peace settlement, **1840, 3789–3812, 3539–40, 3574, 1286.** For ancient history *see in Index* **Roman history.**
**Itas'ca Lake,** small lake in Minn., 140 mi. w. of Duluth; *map,* **2254;** source of Mississippi R., **2265.**
**Itasca Park,** Minn., state park of 30 sq. mi. comprising basin of Itasca L.; beaver protection, **357.**
**Ith'aca,** isl. of Ionian group w. of cent. Greece; 40 sq. mi.; legendary home of Odysseus, **2562.**
**Ithaca,** N.Y. City at s. end of Cayuga L., 47 mi. s.w. of Syracuse; pop. 17,004; Barge Canal terminal; Cornell Univ.; makes drive chains, sporting guns, etc.; trade in coal and salt.
**Ithuriel** (*ĭ-thū'rĭ-ĕl*). Angel of truth in Milton's 'Paradise Lost'; the touch of his spear exposes deceit.
**Ito** (*ē'tō*), **Prince Hirobumi** (1841–1909). Japanese statesman and leading reformer, 4 times premier; drafted constitution; assassinated.
**Iturbide** (*ē-tụr-bē'thā*) or **Yturbide, Augustin de** (1783–1824), emperor of Mexico, **2214.**
**Iuka** (*ī-yụ'kȧ*). Village in n.e. Mississippi, scene of indecisive battle between Federals under Rosecrans and Confederates under Price, Sept. 1862.
**I'van III, the Great** (1440–1505), grand duke of Moscow, **1853.**
**Ivan IV, the Terrible** (1530–84), czar of Russia, **1853.**
**'Ivanhoe',** novel by Sir Walter Scott, **2539, 3151;** story, 'The Tournament of Ashby', **3152–3.**
**Ivanovo-Voznesensk** (*ē-vä-nō'vō-vŏz-nē-sĕnsk'*), Russia. Mfg. town on Uvod R. 160 mi. n.e. of Moscow; pop. 169,000.
**Iviza** (*ē-vē'thä*), one of Balearic Isls., **307,** *map,* **3300.**
**I'vory, 1853–4;** buttons, **549;** carving, **1854,** (anc. Crete) **3156,** *picture,* **28,** (Japan) **1876,** *picture,* **1873;** fossil, **2132, 189;** Sudan, **1093;** walrus tusks, **3668;** Zanzibar, **3838.**
**Ivory-billed woodpecker, 3781,** *picture,* **3780.**
**Ivory Coast,** region in Fr. W. Africa between Liberia and Brit. Gold Coast; 121,976 sq. mi.; pop. 1,407,000; dense forests; palm products, rubber; **33–4,** *map,* **40–1.**
**Ivory-nuts** or **vegetable ivory, 549–50, 1854, 2647.**
**Ivry** (*ē-vrē'*), **battle of, 1637.**
**I'vy, 1854;** "American" (Virginia creeper), **3651, 2852;** poison ivy, **2852, 1854;** sensitive to touch, **2828.**
**Iwakura** (*ē-wä-kụ'rä*), **Prince Tomomi** (1835?–83). Jap. statesman; leader in movement to abolish feudalism.
**Ixion** (*ĭks-ī'ŏn*). In Gk. myth., father of the Centaurs, who for impiously attempting to win the love of Hera was bound forever to a rolling fiery wheel.
**Ixtaccihuatl** (*ēs-täk-sē-wä'tl*) or **Iztaccihuatl,** extinct volcano in Mexico, 40 mi. s.e. of Mexico City, **2218, 2209.**
**Izalco** (*ē-säl'kō*), volcano in Salvador, **3119.**

# J

LIKE C and G, and U and V, the letters I and J were originally forms of the same letter. The vowel sound *i* and the consonant sound *j* were both represented by I until about the 15th century. Then some of the monks who worked on the beautiful illuminated manuscripts of that time used to lengthen the letter I and curve it toward the left when it began a word, thus making of it an ornamental initial. Gradually this form came to be used entirely to represent the consonant sound while the old form was retained for the vowel sound. This consonant sound which, as we have already learned, was like our *y*, came to be *dzh*, like our soft *g*. In German and some other languages, however, it is still pronounced *y*.

**Jabalpur** (*jŭb-ŭl-pụr'*) or **Jubbulpore.** An important mfg. and trading city in cent. India, 550 mi. w. of Calcutta; pop. 101,000; cap. of Jabalpur dist.; makes cotton goods, wire netting, statuary; formerly center for Thugs, society of religious assassins.

**Jabbok** (*jăb'ŏk*). Modern Nahr ez-Zerka, river in Syria; flows 50 mi. w. to Jordan, about 25 mi. n. of Dead Sea; picturesque scenery.

**Jabiru** (*jăb'i-rụ*), the name of various large storks; Amer. jabiru or wood ibis, **3362, 3365.**

**Jacana** (*jăk'ă-nă*). A small rail-like bird with extremely long toes and claws which enable it to walk on the floating leaves of water plants, and with strong spurs at the bend of each wing; plumage black with usually bright chestnut back and parts of wings; two species are found in tropical Amer., one of which, the Mexican jacana, ranges n. to Texas.

**Jacare** (*jăk'ă-rā*), reptile of S.Amer., **923.**

**Jack, jak,** or **jaca tree,** E. Indian tree of same genus as breadfruit; wood is hard, yellow, and used for almost every purpose; fruit weighs 5 to 50 lbs.; **501, 3227.**

**Jack'al,** a dog-like animal, **1855,** *picture,* **1711;** altitude range, *picture,* **397;** Indian, **1748.**

**Jackdaw,** an Old World crow, **2124.**

**Jack Frost, 1375–6.**

**Jackfruit.** *See in Index* **Jack.**

**Jack Horner, 2340.**

**Jack-in-the-pulpit** or **Indian turnip,** Amer. perennial herb of family *Araceae;* common in most shady woods; bulb-like stem, **532.**

**"Jack-knife" bridge,** *pictures,* **509.**

**Jack-o'-lantern** or **Will-o'-the-wisp, 3742.**

**Jack-o'-lanterns,** for Hallowe'en, **2934.**

**Jack-rabbits, 1584;** length of leap, **1583.**

**Jacks, Lawrence Pearsall** (born 1860). Eng. theologian and philosopher; editor of *Hibbert Journal,* a Unitarian review; brilliant literary sketches.

**Jacksnipe, 3261.**

**Jackson, Andrew** (1767–1845), 7th president of U.S., **1855–8;** relations with Benton, **382, 384;** "corrupt bargain" charge, **15, 785, 1856;** influence over Polk, **2871;** in War of 1812, **3672, 1856.** —*Administration,* **1856–8, 3604;** Webster-Hayne debate, **3710;** Garrison publishes *The Liberator,* **1400;** McCormick invents reaper, **2095;** tariff and nullification, **3348, 3710, 3711, 786;** Texas secedes from Mexico, **3478;** Seminole War, **3617, 1773;** panic of 1837, **1857;** relations with Van Buren, **3616;** Tyler opposes policy, **3570.**

**Jackson, Charles Thomas** (1805–80). Amer. chemist and geologist; discovered anesthetic property of ether independently of W. T. G. Morton.

**Jackson, Helen Hunt** (1831–85). Amer. poet and novelist, long known as "H. H.," b. Amherst, Mass.; her lyric 'Verses by H. H.' won praise from Emerson and other critics; her most famous novel, 'Ramona', was a plea for better treatment for Amer. Indians.

**Jackson, Henry R.** (1820–98). Amer. diplomat and soldier; minister to Austria 1854–58, to Mexico 1885–86; maj.-gen. commanding all Ga. state troops at beginning of Civil War; later Confederate brig.-gen.

**Jackson, Thomas Jonathan** (1824–63), "Stonewall," Confederate general, **1858;** at Chancellorsville, **687, 779.**

**Jackson,** Mich., mfg. and r.r. center on Grand R. 76 mi. w. of Detroit; pop. 48,374; state prison; machine and foundry shops; harvesting machines and automobiles; **2224.**

**Jackson,** Miss., cap. and important commercial city on Pearl R. 181 mi. n. of New Orleans; pop. 22,-817; large trade; cottonseed and lumber products, machinery; Millsaps and other colleges; **2264;** capitol, *picture,* **2264.**

**Jackson,** Tenn. Trade, mfg., and r.r. center 80 mi. n.e. of Memphis on Forked Deer R.; pop. 18,860; agricultural and cotton interests; engines, lumber machinery; Union Univ. and other educational institutions; Federal base in Civil War.

**Jackson, Fort.** *See in Index* **Fort Jackson.**

**Jackson Lake,** Wyo., near w. boundary; 8 mi. long; its outlet is main feeder of Snake R.; *picture,* **3818.**

**Jacksonville,** Fla., port and railway center; pop. 91,558; **1858–9.**

**Jacksonville,** Ill. City 30 mi. s.w. of Springfield; pop. 15,713; Illinois Woman's College; institutes for blind, deaf, dumb, and insane; woolen garments, steel bridges.

**"Jack Spratt,"** origin, **2340.**

**Ja'cob,** Hebrew patriarch, 2d son of Isaac, supplanter of his brother Esau; husband of Leah and Rachel and progenitor of Israelites (Gen. xxv–l), **1889–90;** burial place, **2644.**

**Jacobi** (*yä-kō'bi*), **Abraham** (1830–1919). Noted Amer. physician, b. Germany, called founder of Amer. pediatrics; started clinics throughout New York City for children.

**Jac'obins,** club of Fr. Rev. period, **1859;** Committee of Public Safety, **1370;** Lafayette plots against, **1956;** and Napoleon I, **2392;** Robespierre leads, **3027.**

**Jacobites** (*jăk'ō-bīts*), adherents of James II or the direct Stuart line after Eng. Rev. of 1688; uprisings suppressed, **2914–5, 1428.**

**Jacquard** (*jă-kärd'*) **loom,** invented by Joseph Marie Jacquard (1752–1834), of Lyons, France; uses, **3327, 3080, 1937, 1949,** *pictures,* **3239, 1951–3.**

**Jacque** (*zhäk*), **Charles Emile** (1813–94). Fr. animal and landscape painter and etcher; he was sheep painter of the Barbizon school as Troyon was its cattle painter; even more important as an etcher because of his faultless technique.

**"Jacques Bonhomme," 1344.**

**Jade,** a semi-precious stone, **1411;** in Burma, **541.**

**Jael** (*jā'ĕl*). Hebrew woman exalted in the 'Song of Deborah' as "blessed among women" because she killed Sisera, leader of the Canaanites.

**Jaffa** (*jăf'ă*) or **Joppa.** Port of Palestine on Mediterranean, 35 mi. n.w. of Jerusalem; pop. 54,000; exports wine, oil, and sesame; Jaffa oranges are reputed the finest in the world.

**Jagannath** (*jä-gä-näth'*), **Juggernaut,** or **Puri.** Town on e. coast of India noted for temple to Jagannath (Vishnu); at annual festival idol is drawn on enormous car under which devotees were formerly supposed to cast themselves.

**Jagellon** (*yä-gĕl'ŏn*), famous royal family whose members for two centuries ruled in Lithuania, Poland, Hungary, and Bohemia, **2859.**

**Jag'gery.** The sugar obtained from the sap of the E. Indian palms, especially the nipa and coconut; commercially not important but used generally in countries where it is produced.

**Jag'uar,** a wild cat, **1859, 658.**

**Jainism** (*jīn'ĭzm*), religious sect in India, founded by Vardhamana Mahavira, an older contemporary of Buddha, **525, 1749.**

**Jaipur** (*jī-pụr'*) or **Jeypore.** A native Rajputana state of India; 15,-579 sq. mi.; pop. 2,640,000; chiefly agricultural; some marble, copper, and cobalt found in the hills.

**Jaipur** or **Jeypore,** mfg. and commercial city in n.-cent. India, 150 mi. s.w. of Delhi; pop. 138,000; cap. of native state Jaipur; **1745,** *pictures,* **1742, 1746.**

**Jajce** (*yi'tsē*), Jugo-Slavia. Town 65 mi. n.w. of Serajevo; chief outpost of e. Christendom from 1463 until captured by Turks 1528.

**Jal'ap.** A perennial twining plant (*Ipomoea jalapa*) with large flowers; grows in Mexico near the town of Jalapa, whence its name; the root contains a resin which is much used in cathartics.

**Jalisco** (*hä-lēs'kō*), Mexico. State on cent.-w. coast; 33,492 sq. mi.; pop. 1,210,000; cap. Guadalajara; corn, wheat, tobacco; cattle; iron and silver; one of the wealthiest Mex. states.
**Jamaica** (*ja-mā'kȧ*), largest isl. of Brit. W. Indies; 4200 sq. mi.; pop. 900,000; **1859–60, 3718,** *maps,* **938.**
**Jamaica banana, 326.**
**Jamaica ginger, 1460.**
**Jamaica pepper.** Same as **Allspice.**
**James I** (1566–1625), king of England, **1860–1, 3148, 3372;** Bible translation, **389;** Elizabeth secures succession, **1138;** Gunpowder Plot, **1228;** New Hampshire grants, **2456;** opposes use of tobacco, **3508;** relations with Puritans, **2937;** Raleigh, **2975, 2976.**
**James II** (1633–1701), king of England, **1861;** capture of New Amsterdam, **2497, 694;** Charles II secures succession, **694;** and Marlborough, **2149–50;** Revolution of 1688, **1861, 2914, 1810, 3741.**
**James I** (1394–1437). King of Scotland, poet and constitutional reformer; succeeded 1406 while captive in England; released 1424; murdered by rebel nobles.
**James IV** (1473–1513). King of Scotland; succeeded 1488; killed at Flodden; figures in Scott's 'Lady of the Lake'.
**James V** (1512–42). King of Scotland; succeeded 1513; father of Mary Queen of Scots.
**James (James Francis Edward Stuart)** (1688–1766), "the Old Pretender," **2914.**
**James, Saint,** the elder, son of Zebedee, one of the 12 apostles, **157.**
**James, Saint,** the younger, son of Alpheus, one of the 12 Apostles, **157.**
**James, the Lord's brother.** Traditional author of Epistle of James.
**James, Henry** (1843–1916), novelist and essayist, b. New York, became Brit. subject (1915); refined and subtle but involved and artificial stylist ('Daisy Miller'; 'The Portrait of a Lady'; 'The Finer Grain'); brother of William James; work characterized, **115, 2541.**
**James, Jesse W.** (1847–82), notorious Amer. outlaw, **781.**
**James, William** (1842–1910), Amer. psychologist, b. New York City; brilliant, original and highly readable philosopher ('Principles of Psychology'; 'Varieties of Religious Experience'; 'Pragmatism'); contribution to psychology, **2931;** experiment in spiritualism, **3327;** philosophy, **2773;** quoted, **26, 1557, 2772, 2773, 2930.**
**James, Epistle of.** Book of the New Testament, addressed by James, the Lord's brother, from Jerusalem to twelve tribes of the Dispersion, inculcating practical morality.
**James Island,** isl. in Charleston Harbor, S.C.; once a peninsula, **3122.**
**James Millikin University.** At Decatur, Ill.; co-ed., Presb.; founded 1901; liberal arts, engineering, fine arts, commerce and finance.
**Jameson** (*jām'sŏn*), **Sir Leander Starr** (1853–1917), Scotch physician, leader of "Jameson raid" on the Transvaal (1895); "lived it down" to become leader of S. African Progressive party and prime minister (1904–08) of Cape Colony; **3527, 3282;** aided by Rhodes, **3011.**
**James** or **Dakota River,** rising in e.-cent. N.D., flowing through S.D. to Missouri R.; length 500 mi.: **3294,** *maps,* **2524, 3296.**
**James River,** Va., 450 mi.; expands into estuary 50 mi. long flowing through Hampton Roads into Chesapeake Bay; **1861, 716, 3648,** *map,* **3650;** chief cities on, **2513, 3019;** early route to west, **3582.**
**Jamestown,** N.Y. Summer resort and mfg. city on outlet of Chautauqua L., 58 mi. s.w. of Buffalo; pop. 38,917; wood and metal furniture, metal doors and interior trim, textiles.
**Jamestown,** N.D. City on James R., 80 mi. w. of Fargo; pop. 6627; trading center of agricultural and stock-raising region; Jamestown College.
**Jamestown,** Va., first permanent settlement made by English in Amer.; pop. 1122; **1861;** burned (1676), **301;** Capt. John Smith, **3253;** first legislative assembly in Amer., **3603;** first manufacture of glass in U.S., **1474.**
**Jamestown College.** At Jamestown, N.D.; co-ed., Presb.; reopened 1909 (first organized 1883 but closed 1893); arts and science, music, expression, domestic science, commerce.
**Jams and jellies,** canning, **632;** food value, **1322.**
**Janauschek** (*yä'nou-shĕk*), **Fanny** (1830–1904). Amer. actress, b. in Bohemia, played in Germany for many years, finally settled in U.S., where she appeared as Lady Macbeth, Iphigenia, Meg Merrilies, and in many other parts.
**Jane Eyre.** Plain, shy governess, heroine of Charlotte Brontë's 'Jane Eyre'.
**Janesville,** Wis., industrial center on Rock R., 79 mi. s.w. of Milwaukee; pop. 18,293; trade in tobacco, grain, and sugar beets; makes farm implements, textiles, motors, shoes, fountain pens; **3772.**
**Janiculum,** anc. name of hill in Rome, **3056;** in story of Horatius, **3494.**
**Janina** (*yä'nē-nä*) or **Yanina.** Town in n.w. Greece; pop. 17,000; taken from Turkey 1913; makes gold ware, silks.
**Janizaries** (*jăn'i-zā-rĭz*) or **Janissaries,** a powerful military force of Turkish Empire; suppressed 1826 by Mahmud II; **3559, 3558.**
**Jan'sen** or **Janse'nius, Cornelius** (1585–1638). Dutch theologian, bishop of Ypres, founder of Jansenism.
**Jan'senism.** A doctrine intended to reform Catholicism, defended by Pascal but condemned by several popes as heresy, which rent France in 17th and early 18th centuries.
**Jan'uary,** first month of year, **1861;** birthday stone, **1409.**
**Ja'nus,** in Rom. myth., two-faced god, **1861.**
**Japan',** isl. empire of Asia; 260,738 sq. mi.; pop. 77,006,000; cap. Tokyo; **1862–72,** *maps,* **232–3, 1864,** *Study Outline,* **3922;** child life, story, **1870–2;** costume, **1871, 3511;** earthquakes, **1064, 1066;** education, **1868, 3511, 1871;** emigration, **582, 1602;** festivals, **2478, 1872;** government, **1868, 1869;** houses, **1870, 3511, 1064;** kite-flying, **1931;** octopus used as food, **943;** Pacific isl. possessions and mandates, **2624;** religion, **1868, 2994,** *picture,* **1867;** *sake,* national drink, **3015;** writing, **1873, 1871–2, 3816.**
*Geography and industries:* agriculture, **1864, 1866, 1332, 3013, 1460–1, 3509, 3510,** *pictures,* **3013, 3014;** camphor, **594;** cap. Tokyo, **3510–1;** chief cities and manufactures, **1864, 1866–7, 2602, 2387, 3510–1, 3830–1, 1779;** elevation, *map,* **232–3;** fisheries, **1864, 943, 2616, 3167;** foreign trade, **1864, 1866, 2602, 3830–1;** Formosa, **1332;** Korea, **1942–4;** mining, **1867–8;** physical features, **1863–4;** population, **1866,** *map,* **232–3;** rainfall, *map,* **232–3;** shipping, **3219;** silk industry, **1864, 1866, 3235,** *pictures,* **1868, 3234–6;** tea, **3445–50;** vegetation, **1863,** *map,* **232–3.**
*History,* **1862, 1869–70;** Xavier's mission, **3823;** opened to foreigners, **1240, 3830;** Chinese relations, **748;** Russo-Japanese War, **3098, 2135;** World War, **3790;** Shantung, **3195–6, 3796;** Siberia, **3812, 3229.**
**Japan, Sea of,** part of Pacific Ocean between Japan and continent of Asia; *map,* **1864;** battle in Russo-Japanese War, **3098.**
**Japanese art, 1873–6;** carved wood and ivory, **1873, 1874, 1876;** color prints, **1876,** *picture,* **1875;** enameling, **1145,** *pictures,* **1147, 1874;** Kyoto, center of, **1945–6;** lacquerware, **1954, 1876;** pottery, **1874, 2387, 2883.**
**Japanese current, 2558;** effect on Alaska, **77,** *map,* **79;** effect on Calif., **581.**
**Japanese persimmon, 2740.**
**Japanese quince, 2950.**
**Japanese sika** (*sē'kȧ*), a decr. **981.**
**Japan'ning** or lacquering, **1954.**
**Japheth** (*jā'fĕth*) or **Japhet.** Third son of Noah.
**Japura River.** Same as **Yapura.**
**Jaques** (*jā'kwēz*), in Shakespeare's 'As You Like It', **225.**
**Jarley, Mrs.** In Dickens' 'Old Curiosity Shop', owner of "Jarley's waxworks" and friend of Little Nell.
**Jarnac** (*zhär-näk'*), France, town on Charente R., 60 mi. n. of Bordeaux; scene of Duke of Anjou's victory over Huguenots in 1569; Condé killed, **826.**
**Jar'rah tree,** a eucalyptus, **1187.**
**Jas'mine,** a garden shrub, **1876–7;** S. Amer. species, **106.**
**Ja'son,** in Gk. myth., leader of Argonauts, **193.**
**Jasper, William** (1750?–79). Amer. Rev. soldier, hero of many romantic exploits, especially the rescue (1776) of the colors at Ft. Moultrie; refused to accept commission because uneducated.
**Jasper,** a yellow semi-precious stone, **1409;** a form of quartz, **2945;** silica base, **3233.**
**Jasper Park,** in Alberta, on e. slope of Canadian Rockies (4400 sq. mi.), **2400.**
**Jassy** (*yäs'ē*) or **Iasi** (*yä'shē*), Rumania, trade center of Moldavia, 200 mi. n.e. of Bucharest; pop. 76,000; **3082.**
**Jats** or **Jauts,** a people of n.w. India numbering about 9,000,000, **1693.**
**Jaunpur** (*joun-pur'*). A city in n.e. India on Gumti R., 34 mi. n.w. of Benares; pop. 30,000; once a magnificent Mohammedan capital.
**Jaunting car,** Irish, *picture,* **1809.**
**Jaurès** (*zhō-rĕz'*), **Jean** (1859–1914). Fr. socialist, ardent defender of Dreyfus, strong opponent of militarism; assassinated by fanatic because of his opposition to French participation in the World War.
**Java** (*jä'vȧ*), isl. in Dutch E. Indies; 50,557 sq. mi.; pop. 35,000,000; cap. Batavia; **1877–9,** *maps,* **1072, 232–3;** "ape-man" of, **2133;** coffee industry, **822, 824;** gibbon, *picture,* **2288;** quinine, **2950;** scenes in, *pictures,* **229;** teak industry, **3451.**
**Jaw,** in birds, **400;** fish, **1274;** human, *pictures,* **3453;** insects, **1787;** rodents, **3036;** snakes, **3259.**
**Jaxartes** (*jăks-är'tēz*), anc. name of Syr-Darya, r. in cent. Asia; flowing n.w. to Aral Sea; Alexander the Great at, **87.**
**Jay, John** (1745–1829), Amer. jurist and statesman, **1879–80, 3004.**
**Jay'hawkers,** in Civil War, **781.**
**Jayhawker State, 3347.**

**Jays,** bird group of crow family, **440.**
**Jay's Treaty,** between U.S. and Gt. Brit. (1794), **1880;** criticized by Monroe, **2306.**
**'Jean Christophe',** novel by Rolland, **2541.**
**Jeanne d' Arc** (*zhän därk*). *See in Index* **Joan of Arc.**
**Jeannette** (*jĕ-nĕt'*), Pa. Borough 26 mi. s.e. of Pittsburgh; pop. 10,627; in agricultural, coal-mining, and natural gas region; glass, lamps, tableware, automobile tires, bricks, macaroni.
**Jeannette Expedition.** Amer. Arctic expedition 1879 under Lieutenant-Commander De Long; the *Jeannette* was crushed in ice n. of Siberia; De Long and two-thirds of crew reached shore in boats, but half of them, including De Long, died of starvation.
**Jean Valjean** (*zhaṅ vălzhäṅ'*), hero of 'Les Miserables'; story of, **1695–6.**
**Jebb, Sir Richard C.** (1841–1905), brilliant Scotch classical scholar; quoted, **1536.**
**Jeb'el Ayashi,** mountain in Morocco, **2328.**
**Jeb'usites,** Canaanite tribe, **1886.**
**Jef'ferson, Joseph** (1829–1905), Amer. actor, b. Philadelphia, famous in play of 'Rip Van Winkle', *pictures,* **1037.**
**Jefferson, Thomas** (1743–1826), 3d president of U.S., **1880–3;** and John Adams, **13, 14;** Colorado originally named for, **844;** drafts Declaration of Independence, **975–6;** influences Monroe, **2305;** opposes Jay Treaty, **1880;** political theories, **1569, 1882, 2155, 3677;** elected president, **3637, 14;** quoted, **3601;** secretary of state, **555;** vice-president, **13.** —*Administration,* **1883, 3604;** Louisiana Purchase, **2072–3;** Lewis and Clark expedition, **1989;** 12th amendment, **3594, 3637;** expedition against Barbary pirates, **971, 1973;** Monroe's treaty with Gt. Brit., **2306;** Burr's conspiracy, **543;** slave importation prohibited, **3249, 2434;** Fulton's steamboat, **1381;** Chesapeake affair, **3670–1;** embargo policy, **1140, 3671, 521.**
**Jefferson Barracks,** St. Louis, **3110.**
**Jefferson City,** Mo., state cap., on Missouri R.; pop. 14,490; varied mfrs., commercial center for agricultural and rich mineral region; **2272;** capitol, *picture,* **2270.**
**Jefferson River,** headstream of Missouri R. in s.w. Mont.; flows n.e. 140 mi.; **2273.**
**Jefferson Trail, 3024.**
**Jeffersonville,** Ind., port on Ohio R. opposite Louisville, Ky.; pop. 10,098; falls furnish power for mfrs. of lumber, r.r. cars, steamboats, etc.; quartermaster's supply depot, **1760.**
**Jeffery, Walter** (born 1861), Australian journalist and author; works, **268.**
**Jeffreys, George, Baron** (1648–89). Eng. judge, chief justice, and later lord chancellor under James II; notorious for brutality in "bloody assizes" following Monmouth's insurrection.
**Jehoshaphat** (*jĕ-hŏsh'ă-făt*). Son of Asa and king of Judah, 9th cent. B.C.
**Jehoshaphat, Valley of.** A place mentioned in the Bible; supposed to be valley between Jerusalem and the Mount of Olives.
**Jeho'vah** (more properly **Yahweh).** The Hebrew name for the God of Israel; means the "self existent" or "unchangeable One"; in English versions generally rendered "the Lord."
**Jehu** (*jē'hū*). King of Israel; killed Jezebel and massacred house of Ahab (II Kings ix–x), enemy of Baal worshipers; furious driver (II Kings ix, 20), hence, nickname of coachman.
**Jekyll** (*jē'kĭl*), **Dr.** The kindly reputable physician in R. L. Stevenson's 'Strange Case of Dr. Jekyll and Mr. Hyde', who discovers a drug by which he can transform himself into the loathsome embodiment of his worse self, the criminal ruffian Hyde.
**Jellicoe** (*jĕl'ĭ-kō*), **John Rushworth, Viscount** (born 1859), Brit. admiral, **356.**
**Jelly-fish,** a primitive coelenterate animal, **1883–4, 3944;** evolutionary position, *diagram,* **128;** lowest animal with nerves, **2437.**
**Jemappes** (*zhĕ-mäp'*). Village in Belgium 3 mi. s.w. of Mons; decisive defeat of Austrians by Fr. Rev. Army 1792.
**Jena** (*yā'nà*), Germany, famous univ. town of Saxe-Weimar on Saale R. 45 mi. s.w. of Leipzig; pop. 49,000; optical works, **1474.**
**Jena, battle of** (1806), **2394, 2929;** effect in Prussia, **1448.**
**Jena, University of.** One of the chief Ger. univs., founded about 1547; noted for its many distinguished teachers, including Fichte, Schelling, Hegel, Schiller, Haeckel, and Eucken; identified with liberal movement in theology.
**Jenghiz Khan.** Same as **Genghis Khan.**
**"Jenkin's Ear, War of," 2046.**
**Jenner, Edward** (1749–1823), Eng. physician, discoverer of smallpox vaccination, **3613.**
**Jennings, Sarah.** *See in Index* **Marlborough, Sarah, Duchess of.**
**Jennings,** La., town in s.w. on Mermenteau R. about 90 mi. w. of Baton Rouge; pop. 3824; **2070.**
**Jenny** (spinning achine). *See in Index* **Spinning jenny.**
**'Jenny Jones',** Eng. folk-song, **1318.**
**Jephthah** (*jĕf'thà*). Judge of Israel who, in fulfilment of a rash vow, sacrificed to the Lord the first creature that met him on return from victory, his only daughter (Judges xi).
**Jer'ba.** Fr. isl. off e. coast of Tunis, n. Africa; 425 sq. mi.; pop. 45,000 mostly Berbers; the lotus-eaters' isl. of Gk. and Rom. geographers.
**Jerbo'a,** a rat-like animal, **2977.**
**Jeremi'ah** (7th cent. B.C.), one of the major Hebrew prophets, last before the exile; Book of Jeremiah is one of the greatest and longest of the Old Testament prophetical books; prophesies disaster to Judah, **2922.**
**Jerez (or Xerez) de la Frontera** (*hā-rāth' dā lä frŏn-tā'rä*), Spain. Old city in s., 14 mi. n.e. of Cadiz; pop. 63,000; famous for sherry wine, to which it gave the name; battle (711), **3303.**
**Jericho** (*jĕr'ĭ-kō*), important city of anc. Palestine 7 mi. n. of Dead Sea; miraculously captured and almost destroyed by Joshua (Josh. vi, 20–4); now poor village of er-Riha; **2643.**
**Jericho rose,** or resurrection plant, **554.**
**Jerked beef, 2316,** *picture,* **631.**
**Jerobo'am I,** leader of revolting 10 tribes and first king of Israel (10th cent. B.C.) after separation from Judah (I Kings xii, 20), **1890.**
**Jerome** (*jĕ-rōm'*), **Jerome K.** (born 1859). Eng. humorist and dramatist ('Idle Thoughts of an Idle Fellow'; 'The Passing of the Third Floor Back').
**Jerome, Saint** (340?–420), most learned of early Fathers of Latin church; translated Bible, **389.**
**Jerome of Prague** (d. 1416), learned and eloquent Bohemian religious reformer and friend of John Huss, **1705.**
**Jersey,** largest of Channel Isls., 20 mi. from Fr. coast; 45 sq. mi.; pop. 52,000; chief city St. Helier; **687.**
**Jersey cabbage,** tree-like plant of the cabbage family, **553.**
**Jersey cattle,** breed originating in isl. of Jersey, **950, 687.**
**Jersey City,** N.J., mfg. city on Hudson R. opposite New York City; pop. 298,103; **1884–5;** largest clock in U.S., **798,** *picture,* **800;** tobacco mfrs., **3510.**
**Jersey cloth, 804.**
**Jersey tea,** or wintergreen, **3752.**
**Jeru'salem,** Palestine, the anc. cap. of the Hebrew nation and the largest city of Palestine; pop. 60,000; **1885–6;** Crusades, **929–32, 3112;** captured by Nebuchadnezzar, **1891;** captured by Pompey, **2878;** captured by Titus, **1891;** Solomon's temple, **3274, 390;** taken in World War, **2643, 3798.**
**Jerusalem corn,** or kafir corn, **3276.**
**'Jerusalem Delivered',** epic by Tasso, **3440, 1833.**
**Jes'se.** Father of David; "the tree of Jesse," a favorite medieval church emblem, represents Jesse as the root and the Savior or Virgin and Child as the supreme flower (Isaiah xi, 1, 10).
**Jes'sica,** Shylock's fair daughter who elopes with Lorenzo in Shakespeare's 'Merchant of Venice', **2199.**
**Jesuits** (*jĕz'yu-ĭts*) or **Society of Jesus,** religious order founded by Loyola, **2075;** and Counter-Reformation, **2987, 2989;** missions in N. Amer., **2151, 1900;** spread use of quinine, **2950;** Xavier one of the founders, **3823.**
**'Jesus, Sayings of,'** anc. manuscript, **390.**
**Jesus Christ,** founder of Christianity, **1887–8;** and the Apostles, **157, 2745;** reputed birthplace, **387;** 'The Last Supper', **2691, 3644,** *picture,* **3643;** and Peter, **2745, 2665;** sacred places in Jerusalem, **1886;** sacred places in Palestine, **2644–5;** and the Wandering Jew, **3668;** washes feet of disciples, *picture,* **2631.**
**Jesus College,** Oxford, **2610.**
**Jet,** a mineral, **1411.**
**Jetsam.** *See in Index* **Flotsam.**
**Jetty,** a pier or embankment used to direct or strengthen current or shelter a harbor, **1888, 1578.**
**Jew, the Wandering, 3668–9.**
**Jewels.** *See in Index* **Gems.**
**Jewel weed, 3712.**
**Jew'ett, Sarah Orne** (1849–1909). Amer. short-story writer and novelist, b. South Berwick, Me. ('The King of Folly Island'; 'Tales of New England'; 'The Country of the Pointed Firs'—exquisite studies of New England character).
**'Jew of Malta'.** Marlowe's tragedy whose chief character, Barabas, is believed to have contributed suggestions for Shakespeare's Shylock.
**Jews,** "the children of Israel," **1889–92;** Afghans claim descent from, **31;** anti-Semitism, **787;** distribution, **2994;** famous Jews of modern times, **1892;** Jerusalem, **1885–6;** language and literature, **1624–5, 2376, 388–9, 390;** music (anc.) **2376;** New Year, **2479;** Passover, **2691;** in Poland, **2858;** religion, **2294, 388, 390;** in Rumania, **3082;** in Russia, **3088, 1892;** Sabbath, **3103;** surnames, **2389;** Zionist movement, **1892, 1886.**
*History:* Abraham founds nation, **3, 1889;** Egyptian captivity, **1890, 2333, 503, 1106;** conquer Canaan, **1890–1, 2770;** wars with Philistines, **2770;** reign of David, **967,**

**1886;** Solomon, **3274;** prophets, **2922–3, 1891;** captivity in Babylon, **1891, 298, 2737;** story of Esther, **1179–80;** life and teachings of Jesus, **1887–8;** dispersal and persecution, **1891–2.**

**Jew's harp,** musical instrument, **2383.**

**Jez'ebel.** Idolatrous wife of Ahab, cursed by Elijah for treachery to Naboth (I Kings xxi) and murdered by Jehu (II Kings ix, 30–7).

**Jezreel** (*jĕz'rē-ĕl*), anc. city in plain of Jezreel, 50 mi. n. of Jerusalem; cap. of Israel under Ahab; modern town, Zerin, has a few ruins of little interest; **2645.**

**Jhelam** (*jā'lŭm*) or **Jehlam River,** anc. Hydaspes, flows s.w. from Himalayas into Chenab R. in n. India (450 mi.); Vale of Cashmere, **652;** reached by Alexander, **1752.**

**Jib,** a sail, **3209.**

**Jibuti** (*zhē-bu-tē'*) or **Djibouti.** Chief port and cap. of Fr. Somaliland, E. Africa; pop. 14,000; terminus of Abyssinian r.r.

**Jicarillas** (*hē-kä-rēl'yäs*), **Indian** tribe, **2467.**

**Jig'ger, chigger,** or **chigoe,** a skin parasite, *picture,* **2678.**

**Jigger,** mold used in pottery-making, **2904.**

**"Jim Crow" laws, 2434.**

**Jiménez.** Same as **Ximenes.**

**Jim'nu Ten'no** or **"Son of Heaven"** (7th and 6th cent. B.C.). Legendary founder of the line of Jap. mikados, descendant of the sun-goddess and first ruler of Japan.

**Jimson weed,** a poison weed of the nightshade family, **2854,** *picture,* **2853.**

**Jin'go** (2d and 3d cent. A.D.). Legendary warlike empress of Japan, on whose alleged conquest of Korea Japan bases traditional claims of suzerainty over that country; name not connected with modern "jingoes"—a term which was derived from a song popular in England in 1878: "We don't want to fight, but, by jingo, if we do—."

**Jinn.** Same as **Genie.**

**Jinrik'sha** or **rickshaw,** light man-drawn carriage said to have been invented in 1869 by an Amer. Baptist missionary in Japan, **3510,** *picture,* **39.**

**Jiu-jit'su** or **ju-jutsu,** form of wrestling, **3816.**

**Joachim** (*yō'ä-kēm*), **Joseph** (1831–1907). Hungarian violinist and composer, called "the king of violinists" ('Hungarian Concerto').

**Joan** (*jōn*). Mythical woman pope supposed to have reigned about 855–858 as John VIII; the story says she fell in love with a Benedictine monk and fled with him to Athens disguised as a man, afterwards going to Rome and becoming a priest.

**Joan'na** (1479–1555). Queen of Castile, daughter of Ferdinand and Isabella, and mother of Emperor Charles V and Emperor Ferdinand I; did not actually rule because partially insane.

**Joan of Arc** (1412–31) "The Maid of Orleans," **1893–4, 1700, 1352,** *picture,* **1701;** and Charles VII, **694, 696,** *picture,* **695;** heroine of Schiller's play, **3137;** statues, *pictures,* **3162, 1343.**

**Jo'ash** or **Jehoash.** King of Israel, about 798–790 B.C.; expelled the Syrians from kingdom, defeated and captured Amaziah, king of Judah, and plundered the temple at Jerusalem (II Kings xiii–xiv).

**Joash** or **Jehoash.** King of Judah, about 837–797 B.C.; slain by conspiracy of his own servants (II Kings xi, xii; II Chronicles xxii–xxiv).

**Job,** long-suffering hero of the Book of Job in the Old Testament, **1894.**

**Jocas'ta,** in Gk. myth., mother and wife of Oedipus, **2566.**

**Jodhpur** (*jōd-pur'*), city in n.w. India; pop. 60,000; cap. of native state Jodhpur or Marwar; **1745.**

**Jo'el** (5th cent. B.C.). Hebrew minor prophet, author of the Book of Joel, the 29th book of the Old Testament; he prophesied the judgments that were to come to Israel, and urged the people to repent and reform.

**Joffre** (*zhŏ'fr'*), **Joseph Jacques Césaire** (born 1852), Fr. general and marshal of France, **1894–5, 3792, 2150–1.**

**Jogues** (*zhōg*), **Father Isaac** (1607–46). Fr. Jesuit missionary and martyr, twice captured and tortured by Mohawk Indians, first time mutilated, 2d time killed, at Ossernenon, N.Y., now a place of Cath. pilgrimage.

**Johan'nesburg,** S. Africa, largest city in S. Africa; center of one of world's greatest gold fields; pop. 250,000; **1895, 3282,** *picture,* **3281.**

**John** (1167–1216), king of England, **1895–6;** rebels against father, Henry II, **1634;** plots against brother, Richard I, **3016;** loses Normandy, **2762;** struggle with Pope Innocent III, **1896, 1780;** defeated at Bouvines, **2606;** grants Magna Carta, **2121;** in 'Ivanhoe', **3152–3.**

**John** (1319–64), king of France, called "the Good," succeeded 1350; at Poitiers, **1700.**

**John III,** king of Poland. *See in Index* **Sobieski, John.**

**John,** popes. For list *see in Index* **Pope.**

**John XXIII** (d. 1419). Pope, called Council of Constance by which he was deposed (1415); imprisoned in Germany.

**John I** (1357–1433), king of Portugal, called "the Great," and "father of his country," chosen king 1385; father of Henry the Navigator, **1638.**

**John II** (1455–95), "the Perfect," king of Portugal; under him Portugal reached height of its power; and Columbus, **846.**

**John VI** (1769–1826), king of Portugal; succeeded 1816 (regent from 1799); accepted Port. constitution after insurrection (1821) and recognized independence of Brazil (1825); exile in Brazil, **496.**

**John, Saint,** one of the 12 Apostles, **157, 2745.**

**John, Don, of Austria** (1545–78). Son of the Emperor Charles V and half-brother of Philip II of Spain, victor over Turks (1571) in famous naval battle of Lepanto.

**John of Gaunt** (1340–99), duke of Lancaster; 4th son of Edward III of England, ancestor of House of Lancaster and through his daughters of Tudor, Stuart, and Hanover-Windsor sovereigns of England; castle, **1959;** descendants, *table,* **3068;** supports Wyclif, **3817.**

**John of Leyden** (1508?–36). Dutch religious (Anabaptist) fanatic and rev. leader; for a year ruled "the Kingdom of Zion" in Munster; cruelly executed by prince-bishop of Munster on capture of city.

**John the Baptist, 1888, 2644;** beheaded, **1645.**

**John, Augustus** (born 1879). Eng. painter of ultra-modern tendencies; distinguished for powerful draughtmanship, fine sense of design, and use of distortion for personal emphasis and decorative effect; painted many portraits of prominent men, including chief figures of Peace Conference.

**John, Epistles of,** 23d, 24th, and 25th books of New Testament, attributed to Apostle John; first exhorts to Christian faith; second and third are short notes, one to a church, the other to Gaius, a member of church; authorship disputed, **157.**

**John, Gospel of,** 4th book of New Testament, attributed to Apostle John; purpose to present life and works of Jesus so as to arouse faith in readers; **1887;** authorship disputed, **157.**

**'John Brown's Body',** Civil War song, **2405, 516.**

**John B. Stetson University.** Co-ed. institution at Deland, Fla.; Bapt.; founded 1882; liberal arts, law, business, normal school, mechanic arts, fine arts, engineering.

**"John Bull,"** nickname for Brit. people, **2507.**

**John Doe.** Fictitious name of plaintiff in action in which real plaintiff's name is withheld. A "John Doe proceeding" is sometimes to fix liability for a known wrong committed by an as yet unknown wrongdoer.

**'John Gilpin',** poem by Cowper, **910, 911.**

**'John Halifax, Gentleman'.** Novel by Miss Mulock; the hero, an orphan, reared in poverty and obscurity, rises to wealth and marries a girl of gentle birth.

**"Johnny Appleseed."** *See in Index* **"Appleseed, Johnny."**

**'Johnny Bear, The story of', 351–4.**

**"Johnny Reb."** Nickname given Confederate soldiers during Civil War by Federals.

**Johns Hopkins University,** at Baltimore, Md.; co-ed.; opened 1876; arts and sciences, engineering, medicine; research work and publication of technical journals; **322, 833.**

**Johnson, Andrew** (1808–75), 17th president of U.S., **1896–8;** organizes part of Tenn. for Union, **1897, 3469;** elected vice-president, **2014.** —*Administration* (1865–69), **1897–8;** Alaska purchased, **1898, 3182, 74;** French forced to quit Mexico, **1898, 2307, 2216;** reconstruction policy, **1897, 3605, 780;** relations with Stanton and impeachment, **1898, 3339.**

**Johnson, Esther** (1680–1728), friend of Jonathan Swift, **3406.**

**Johnson, Hiram Warren** (born 1866), Amer. lawyer and politician, b. Sacramento, Calif.; convicted Ruef, chief of San Francisco "boodlers"; gov. of Calif. 1911–17; elected to U.S. senate 1917; candidate for vice-president, **3062;** in 1920 presidential campaign, **1580.**

**Johnson, Sir John** (1742–1830). Amer. loyalist, b. near Johnstown, N.Y.; son of Sir William Johnson; kept the Six Nations on Brit. side during Amer. Revolution and directed Indian raids.

**Johnson, Pauline** (1862–1913), Canadian poet, daughter of Mohawk Indian chief and Eng. mother ('Flint and Feather', collected poems), **624.**

**Johnson, Richard M.** (1781–1850), Amer. statesman and soldier, b. near Louisville, Ky.; 9th vice-president of U.S.; **3452, 3616.**

**Johnson, Samuel** (1709–84), famous Eng. man of letters, **1898–1900, 1166;** and Burke, **540;** friendship for Goldsmith, **1483–4;** quotations from 'Dictionary', **1898, 2548.**

**Johnson, Tom L.** (1854–1911), Amer. municipal reformer and iron manufacturer, b. Georgetown, Ky.; mayor of Cleveland 1901–09; strenuous advocate of single tax, public ownership of public utilities; **793.**

**Johnson, Sir William** (1715–74), Brit. general and superintendent of Indian affairs in N. Amer.; introduces glove-making in Johnstown, N.Y., **1475.**

**Johnson City,** Tenn., summer resort, mfg. and lumber center 93 mi. n.e. of Knoxville; pop. 12,442; iron furnaces, machinery, tanned leather; normal school, **3468.**

**Johnston, Albert Sidney** (1803–62), Amer. soldier, b. Mason County, Ky.; one of ablest Confederate generals; leader in struggle for Texan independence; killed at Shiloh, **3206.**

**Johnston, Annie Fellows** (born 1863). Amer. author of stories for young people, b. Evansville, Ind.; wrote 'Little Colonel' series, 'Georgina of the Rainbows'.

**Johnston, Sir Harry Hamilton** (born 1859). Brit. administrator, African explorer, zoölogist, and author; originator of plan for Brit. "Cape-to-Cairo" route; discoverer of okapi and other African animals; author of many interesting books on Africa as well as several novels; in 'The Gay-Dombeys' and 'The Veneerings' he follows the career of supposed descendants of characters in Dickens' novels.

**Johnston, Joseph Eggleston** (1807–91), Amer. soldier, b. near Farmville, Va.; served in Black Hawk, Seminole, and Mexican wars with distinguished gallantry; became Confederate general 1861; commanded early operations against McClellan in Peninsular Campaign; Fabian tactics against Sherman in famous Georgia campaign won his opponent's praise as "the equal in all the elements of generalship to Lee"; elected to U.S. Congress in 1876; in campaigns of 1864–65, **3206, 2521.**

**Johnston, Mary** (born 1870). Amer. novelist, b. Buchanan, Va.; author of two of the most popular of historical romances, 'Prisoners of Hope' and 'To Have and To Hold'.

**Johnstown,** N.Y., mfg. city of historic interest, 40 mi. n.w. of Albany; pop. 10,908; silk, lumber, gloves, knit goods, leather, gelatin; named for Sir William Johnson whose mansion, built in 1761, still stands; glove industry founded, **1475.**

**Johnstown,** Pa. Iron and steel mfg. city 7 mi. e. of Pittsburgh on Conemaugh R. in soft-coal dist.; pop. 67,327; makes chemicals, brooms, chairs, clay products, etc.; flood of 1889 took more than 2000 lives.

**Johore** (*jō-hōr'*), independent state in s. end of Malay peninsula; 9000 sq. mi.; pop. 200,000, three-fourths Chinese; **2130.**

**Joinville** (*zhwăn-vēl'*), **Jean, Sire de** (1224–1317). Fr. historian of Louis IX and his First Crusade.

**Jojo River,** in the lower end of Cuba e. of Santiago and midway between it and the sea; about 35 mi. long; **936.**

**Jókai** (*yō'kī*), **Maurus** (1825–1904). Hungarian novelist ("the Magyar Dumas") and revolutionist of 1848; brilliant, prolific but uneven genius ('Timar's Two Worlds').

**Joliet** (*zhō-lyā'*), **Louis** (1645–1700), Fr.-Canadian explorer, **1900, 2151, 1736, 2265.**

**Joliet** (*jō'lĭ-ĕt*), Ill., industrial and r.r. city 35 mi. s.w. of Chicago; pop. 38,442; iron and steel, chemicals, matches; limestone near by; state penitentiary; **1736.**

**Joliette** (*zhō-lē-ĕt'*), Quebec. Town on Assomption R. about 35 mi. n. of Montreal; pop. 9500; tobacco and biscuit factories, foundries, saw, paper, grist, and woolen mills; lime quarrying.

**"Jolly Roger,"** pirate's flag, **2810.**

**Jolo** (*hō-lō'*). Same as **Sulu Islands.**

**Joly** (*jō'lī*), **John** (born 1857), Irish physicist and geologist; estimated earth's age, **1060.**

**Jo'nah,** Hebrew prophet (8th cent.? B.C.); as told in Book of Jonah, disobedient to divine summons, draws storm on ship in which he tries to escape; is thrown into sea and swallowed by a great fish; is saved by Jehovah; delivers divine message to Nineveh but resents city's preservation until taught compassion by the lesson of the gourd; **2923.**

**Jon'athan,** son of Saul and beloved friend of David (I Samuel xx, II Samuel i, 19–27), **967, 1890.**

**"Jonathan, Brother,"** popular personification of U.S., **2507.**

**Jonathan apple, 161.**

**Jones, Henry Arthur** (born 1851), Eng. dramatist; chief works, **1038.**

**Jones, John Paul** (1747–92), Amer. naval hero, **1900–1, 1288;** burial place, **2419;** mission to France, **3003.**

**Jones, Sir William** (1746–94), Eng. orientalist and linguist; pioneer in Sanskrit; **2771.**

**Jonesboro,** Ga. Town 18 mi. s. of Atlanta; Federal victory under Howard, Aug. 1864, resulted in fall of Atlanta.

**Jon'quil,** a type of narcissus, **2397.**

**Jonson, Ben** (1573?–1637), Eng. dramatist, lyric poet, epigrammatist, and scholar; friend of Shakespeare, chief of Mermaid Tavern wits, and literary dictator among young writers ambitious to be "sealed of the tribe of Ben"; **1164, 1034;** chief works, **1038;** court poet, **2848;** burial place, **3719;** on Shakespeare, quoted, **3188, 3191.**

**Jop'lin,** Mo., industrial city in s.w. near Kan. border and 10 mi. from Okla.; pop. 29,902; in one of richest zinc and lead regions in the world; large lead works, mining machinery and supplies; **2270.**

**Joppa** (*jŏp'ȧ*), Palestine. Same as **Jaffa.**

**Jordan, David Starr** (born 1851). Amer. biologist and educator, b. Gainesville, N.Y.; chancellor of Leland Stanford Jr. Univ. and director of the World Peace Foundation.

**Jordan,** sacred r. of Palestine; rises in n., flows 200 mi. s. in deep valley through lakes Merom (Huleh) and Galilee into Dead Sea; **2643–4, 1888.**

**Joseffy** (*yō-sĕf'ĭ*), **Rafael** (1852–1915). Amer. pianist and composer, b. Hungary; after 1880 lived in N.Y. and was recognized as one of the leading teachers and concert virtuosos in America.

**Jo'seph,** Hebrew patriarch, son of Jacob and Rachel; father of Ephraim and Manasseh (Gen. xxxvii-l); **1890.**

**Joseph I** (1678–1711). Holy Roman emperor, succeeded to throne 1705; vigorously prosecuted wars against France and Hungary, and forced pope to acknowledge his brother Charles as king of Spain; a liberal ruler, especially in religion and matters relating to peasantry.

**Joseph II** (1741–90), emperor, son of Maria Theresa; benevolent despot; upset old customs and provoked discontent and revolt; died disillusioned and broken-hearted; **2147.**

**Joseph, Father** (1577–1638). Fr. Capuchin monk, Richelieu's secretary and confidential adviser, nicknamed, because of his influence, the "Gray Cardinal" ("Eminence Grise").

**Joseph, Saint,** husband of Mary the mother of Jesus (Matt. i, ii; Luke ii), **1887.**

**Joseph of Arimathe'a,** rich Israelite, who entombed the body of Jesus, **1888;** brings Holy Grail to Britain, **1391;** and Sir Galahad, *picture,* **224.**

**'Joseph Andrews',** novel by Fielding, **2540.**

**Josephine** (1763–1814), empress of the French, **1901, 451, 2395;** birthplace, **2156.**

**Jose'phus, Flavius** (37?–95?), Jewish historian ('The Jewish War', 170 B.C.–70 A.D.; 'The Jewish Antiquities', from earliest time to reign of Nero), **1625.**

**Josh'ua,** leader of Israelites, successor to Moses, **1890.**

**Joshua.** Sixth book of Old Testament, named for Joshua; account of Jewish settlement in Canaan.

**Josi'ah** (7th cent. B.C.), king of Judah; abolished idolatry and reestablished worship of the Lord (II Kings xxii–xxiii); **1890.**

**Jotunheim** (*yō'tụn-hām*), in Norse myth., home of frost giants, **2560;** Thor's visit to, **3490–2.**

**Jotunheim,** mountainous region of s. Norway, **2532.**

**Joubert** (*you'bĕrt*), **Petrus Jacobus** (1834–1900). Boer general, commandant-general in first and 2d Boer wars; repelled Jameson Raid.

**Jougs,** instrument of torture, *picture,* **2919.**

**Joule, James Prescott** (1818–89), Eng. physicist; formulated law of conservation of energy; measured mechanical equivalent of heat, **1618, 1222, 1799, 2787.**

**Joule.** Unit of electrical energy; practically equal to work done in forcing one ampere against resistance of one ohm for a second; named for J. P. Joule.

**Jourdain** (*zhọr-dăn'*), **M.,** hero of Molière's 'Le Bourgeois gentilhomme' (The Tradesman Turned Gentleman), **2279.**

**Journeyman,** in medieval trade gild, **1460.**

**Joust** (*jŭst*), knightly combat in which the contestants engaged each other singly, **1934–5, 3069–70.**

**Jove** (*jōv*) or **Ju'piter,** chief deity of the anc. Romans, identified with Gk. Zeus, **1903, 3838–9.** *See also in Index* **Zeus.**

**"Jove's flower,"** the clove pink, **2809.**

**Jow'ett, Benjamin** (1817–93), Eng. scholar, theologian, and teacher, master of Balliol College, Oxford; great influence on Eng. life through eminent pupils; translations of Plato, **2832.**

**Juan** (*hwän*) or **Giovanni** (*jō-vän'nē*), **Don.** Profligate hero of Span. legend, betrayer of many women; subject of many works of art, including Mozart's opera, 'Don Giovanni', and Byron's poem, 'Don Juan'.

**Juan de Fuca** (*jụ'ăn dē fū'kȧ*), Pacific Ocean strait between Vancouver Isl., Canada, and Wash., U.S.; *map,* **3687.**

**Juan Fernandez** (*fẽr-năn'dēz*), group of small isls. in S. Pacific; largest isl. Mas-a-Tierra; **737, 2619;** sea-elephants, **3169;** Alexander Selkirk, **933–4.**

**Juarez** (*hụ-ä'rĕth*), **Benito Pablo** (1806–72), Mex. statesman, sometimes called the "Mexican Washington," **2216, 1006.**

**Juarez** or **Ciudad Juarez,** Mexico, city on Rio Grande opposite El Paso, Tex., in stock-raising and agricultural region; pop. 7000; formerly El Paso del Norte; **1139.**

**Ju'bal,** Hebrew inventor of musical instruments (Gen. iv, 21), **2376.**

**Jubbulpore,** India. Same as **Jabalpur.**

**Jucar** (*hụ'cär*) **River,** in e. Spain; 270 mi. to the Mediterranean; *map,* **3300.**

**Judah** (*jụ'dȧ*). Hebrew patriarch, 4th son of Jacob and Leah, traditional ancestor of tribe of Judah.

**Judah,** s. kingdom of Palestine after separation of Israel, **1890–1.**

**Ju'daism,** religion of the Jews. *See in Index* **Jews.**
**Ju'das** (Thaddeus), **the Apostle, 157.**
**Judas Iscar'iot,** disciple who betrayed Jesus for 30 pieces of silver (Matt. xxvi, 14–16, 25, 47–50), **157, 1888.**
**Judas Maccabae'us.** *See in Index* **Maccabees.**
**Judas tree,** the red-bud, **1901.**
**Jude, Epistle of.** Twenty-sixth book of New Testament; doubtful authorship, often attributed to Jude, brother of Jesus, described as "brother of James" (Jude i, 1); exhortation to constancy in Christian faith.
**Judea** (*jụ-dē'ȧ*) or **Judaea,** s. Palestine under Rom. rule, **1891.**
**Judge Advocate General,** in U.S. Army, head of the dept. which controls administration of military law, **3599, 218;** insignia of dept., **3576.**
**Judge Advocate General,** in U.S. Navy, head of the dept. which controls administration of law in the navy, **3599.**
**Judges,** leaders of Israelites, **1890.**
**Judges, Book of.** Seventh book of the Old Testament; describes history of Israelites under the rule of the Judges.
**Judi'ciary.** *See in Index* **Courts of Justice.**
**Ju'dith.** Jewish heroine, captivated Assyrian general Holofernes and slew him while he slept, thereby delivering the besieged Israelites; story told in the apocryphal book of Judith.
**Judson, Adoniram** (1788–1850), Amer. missionary to India; probably greatest and first Amer. foreign missionary; translated Bible into Burmese; **541.**
**Jug'gernaut.** Same as **Jagannath.**
**Jugo-Slavia** (*yū-gō-slä'vi-ȧ*), "kingdom of the Serbs, Croats, and Slovenes"; state formed after World War; 95,000 sq. mi.; pop. 11,340,000; cap. Belgrade; **1901–2,** *maps,* **1196–7, 308;** Belgrade, **376–7;** Bosnia and Herzegovina, **468;** Danube highway, **961–2;** Fiume dispute, **1286, 3812;** Montenegro, **2313;** people, **3250, 307;** Serbia, **3176–7;** territorial gains, **1703, 2097, 1286.**
**Jugur'tha** (d. 104 B.C.), usurping king of Numidia; defied Rom. power for several years, defeating and bribing opposing generals; captured by Marius, **3046.**
**Jujube** (*jụ'jụb*), **Chinese,** a small tree bearing reddish-brown fruits about the size of hazelnuts; introduced into U.S., **48.**
**Ju-jutsu** (*jụ-jụt'sụ*). Same as **Jiujitsu.**
**Jukes.** A family of N.Y. state investigated by R. L. Dugdale and famous for large percentage of pauperism and criminality; records of 709 of 1200 members show 280 paupers, 140 criminals, and large proportion of moral and physical degenerates.
**Ju'lia** (83?–54 B.C.), daughter of Julius Caesar, **2878.**
**Ju'lian** (Flavius Claudius Julianus) (331–363 A.D.). Rom. emperor, called "the Apostate"; nephew of Constantine the Great; brought up as Christian, became philosophic pagan; proclaimed emperor by army 361 A.D.; able ruler and last pagan emperor.
**Julian calendar, 574.**
**Ju'liet,** heroine of Shakespeare's tragedy 'Romeo and Juliet', **3058.**
**Julius I, Saint** (d. 352), pope, **1902.**
**Julius II** (1443–1513), pope, **1902;** and Michelangelo, **2222.**
**Julius III** (1487–1555), pope, **1902.**
**'Julius Caesar',** tragedy by Shakespeare, **3191;** quotations from, **3192.**
**July,** 7th month of year, **1902;** birthday stone, **1409.**
**"July Revolution,"** in France (1830), **1902.**
**Jum'bo,** noted circus elephant, **1128.**
**Jum'na River,** tributary of the Ganges R., n. India; rises in Himalayas, flows 860 mi. s. and s.e. to Ganges R.; **1393;** at Delhi, **990.**
**Jumping mouse,** a N. Amer. mouse with very long hind legs; able to leap from 9 to 15 ft.; hibernation, **1647;** name also applied to jerboa, **2977.**
**Juncaceae** (*jŭn-kā'sē-ē*), plant family including rushes, **3083;** belongs to lily order, **3939.**
**Jun'co,** a plump slate-colored type of finch, **1241.**
**June,** 6th month of year, **1902;** birthday stone, **1409.**
**Juneau** (*jụ-nō'*), **Laurent Solomon** (1793–1856), Amer. pioneer, b. near Montreal, Canada; settles at Milwaukee, **2247.**
**Juneau,** Alaska. Cap. and largest city; on inlet of Pacific 100 mi. n. of Sitka; pop. 3050; commerce in gold, furs.
**June bug,** a beetle, **1902.**
**Jungfrau** (*yụng'frou*), Alpine peak (13,670 ft.), **102, 3413,** *pictures,* **102, 3414.**
**Jun'gle:** Africa, **34, 40, 858–9, 3338;** Amazon, **105, 493,** *picture,* **3285;** Asia, **230,** *picture,* **227;** Borneo, **468;** Cent. America, **680, 2652;** Java, *picture,* **1878;** Malay Peninsula, **2129–30;** New Guinea, **2451, 2453;** of the Orinoco, **2600;** products, **40;** Samoa, **3120.**
**'Jungle Books',** collections of animal stories by Rudyard Kipling; 'The Story of Mowgli', **1927–9.**
**Jungle fowl, 2908.**
**Junior lien bonds, 3359.**
**Junior Red Cross, 2984, 2986.**
**Ju'niper,** various conifer trees or shrubs with dark-blue berry-like cones, **1902–3;** distinguished from other conifers, **3539;** mistakenly called cedar, **671;** thrives in swamps, **3700.**
**Junipero** (*hụ-nē'pā-rō*), **Miguel José Serra, Father** (1713–84), Franciscan missionary to Calif. Indians, founder of chain of 10 Span. missions; converted more than 3000 Indians; b. Majorca; **580, 3124.**
**Ju'nius.** Pen name of author of a famous series of scorching Eng. political letters attacking George III and his ministers 1769–72, real authorship never proved, attributed to more than 40 persons, but generally conceded to Sir Philip Francis.
**Junk,** oriental boat (usually Chinese or Japanese), *picture,* **3525.**
**Junkers** (*yụn'kĕrz*), in Germany, **427.**
**Ju'no,** in Rom. myth., goddess identified with Gk. Hera, **1903, 1639, 1902.** *See also in Index* **Hera.**
**Juno,** an asteroid, **237.**
**"Juno's bird,"** the peacock, **2700.**
**Ju'piter,** in Rom. myth., god identified with Gk. Zeus, **1903, 3838–9.** *See also in Index* **Zeus.**
**Jupiter,** largest of the planets, **2817–8, 1903;** length of day, **2816;** nine satellites, **2818;** orbit, speed, and size, **2815,** *pictures,* **2816;** satellites discovered by Galileo, **1391.**
**Jura** (*jụ'rȧ*) ("deer island"), 4th largest of Inner Hebrides, Scotland; 160 sq. mi.; **1625.**
**Jura Mts.,** on border of France and Switzerland, **1903, 3412, 3414;** stock-raising, **1346.**
**Juras'sic period,** in geology, **1418, 1420,** *pictures,* **1419, 1334.**
**Jurispru'dence,** defined, **1972.**
**Jurua** (*zhụ-rụ-ä'*) **River,** tributary of the Amazon in Brazil; 1200 mi. from source in Peru; *map,* **494.**
**Ju'ry, 1903–5;** established in England, **1905, 1633–4;** in anc. Greece, **1524, 3275;** U.S. Constitution, **3594.**
**Jus gentium** (*jŭs ĝĕn'shi-ŭm*), "law of nations," the beginning of international law, **1794.**
**Jusserand** (*zhŭ-sē-räṅ'*), **Jean Jules** (born 1855). Fr. diplomat and scholar, ambassador to U.S. since 1902; author of several works on Eng. literature and life, notably 'Piers Plowman' and a 'Literary History of the English People'.
**Justice, courts of.** *See in Index* **Courts of Justice.**
**Justice, Department of,** U.S., **3597, 3601.**
**Justin I** (450–527), Byzantine emperor; an ignorant peasant, he rose to rank through army; and Justinian I, **1905.**
**Justin'ian I** (483?–565), Byzantine emperor, **1905, 552;** plague, **433;** silk culture introduced, **3235;** Vandals conquered, **3618.**
**Justin Martyr** (100–165?). An early Church Father; one of foremost Christian apologists; b. in Palestine of pagan parents; said to have been beheaded at Rome.
**Jute, 1905–6;** bleaching, **435;** paper made from, **2667;** used to insulate cables, **556.**
**Jutes,** a Teutonic people who invaded Britain in 5th cent.; generally believed to have come from Jutland; **997, 1152, 3134;** law, **1972.**
**Jut'land,** low flat peninsula of n. Europe forming largest part of Denmark, **994, 996,** *map,* **997.**
**Jutland, battle of** (1916), **3796, 2423;** Beatty at, **356.**
**Ju'venal** (60?–140), **Decimus Junius Juvenalis,** Rom. poet and satirist, **1967.**
**Juvenile courts, 1906;** Jane Addams' work, **17.**

# K

YOU would scarcely guess that our letter K was once the Egyptian hieroglyph  which was the picture of a bowl. But when written it looked like this  and its modified form in the Phoenician alphabet  begins to look somewhat like our K, written backward. The Phoenicians called it *Kaph*, which means the "palm of the hand," or perhaps the "bent hand." The Greeks in transferring *Kaph* to their alphabet gave it its present form and changed the name to *Kappa*. In Latin after C had come to be used for the *k* sound, there was no need of K and it fell into disuse except in certain abbreviations. Anglo-Saxon and early English, under Latin influence, likewise used C for the *k* sound, until the practice of giving C the *s* or *sh* sound before certain vowels (as in *century, cinder, ocean*) led to confusion. Then K came to be used, particularly before e and i, for the hard sound, as in *kind, keg*, etc. The combination *ck* so common in modern English following a short vowel was originally *kk*.

**Kaaba** (*kä'ȧ-bȧ*) or **Kaba,** Mohammedan shrine at Mecca; contains famous sacred Black Stone; **2187,** *picture,* **2186.**

**Kabinda.** Same as **Cabinda.**

**Kabul** (*kȧ-bo͝ol'*), Afghanistan, cap. and largest city, key to n. India; pop. 150,000; in fruit dist.; **31.**

**Kabyles** (*kă-bīlz'*), Berber tribes of Algeria, **37, 97.**

**Kachins,** a marauding people of Indo-Chinese origin living along border of upper Burma, **541.**

**Kadiak Island.** Same as **Kodiak.**

**Kaf'fa.** *See in Index* **Feodosia.**

**Kaffirs** (*kȧf-ērz*), a loosely defined group of Bantu tribes in S. Africa, **3280, 36;** huts, *picture,* **38;** lion hunting, *picture,* **2024.**

**Kaf'ir corn,** a variety of sorghum, **1907,** *picture,* **3276;** often miscalled millet, **2239.**

**Kagera** (*kä-gā'rä*) **River,** in e. Africa, headstream of Nile, **3641.**

**Kagoshima** (*kä-gō-shē'mä*), Japan. One of the chief cities of Kyushu Isl.; pop. 93,000; home of the famous crackled Satsuma ware.

**Kahoolawe** (*kä-hō-ō-lä'vä*), small isl. of the Hawaiian group; 69 sq. mi.; **1603.**

**Kaifengfu** (*kī-fŭng'fö*) or **Kaifong,** China. Walled city, cap. of province of Honan, 450 mi. s. of Peking; pop. 100,000; colony of Jews established 1163.

**Kailas** (*kī-läs'*), temple at Ellora, India, **1707.**

**Kailyard school.** Term applied to group of modern Scotch novelists who write of life of common people with copious use of dialect; best represented by Ian MacLaren and Barrie.

**Kairwan** (*kīr-wän'*), Tunis, sacred city of the Mohammedans; contains beautiful Ukbah mosque, rebuilt in 827, one of the most holy places of Islam; pop. 25,000; **3550.**

**Kaisarieh** (*kī-zȧ-rē'ȧ*), Turkey. Trade center in Asia Minor 160 mi. s.e. of Angora; pop. 54,000; exports carpets, hides, fruit; anc. Caesarea.

**Kaiser** (*kī'zẽr*), official title of Ger. and Holy Roman emperors; origin, **565.**

**Kai'serin Augusta River,** New Guinea, **2453.**

**Kaiserslautern** (*kī'zẽrz-lou-tẽrn*), Germany. Industrial city in Bavaria 35 mi. w. of Mannheim; pop. 56,000; Frederick Barbarossa built castle here about 1152.

**Kaiser Wilhelm Canal.** Same as **Kiel Canal.**

**Kaiser Wilhelm Land** or **German New Guinea, 1072, 2453.**

**Kajar** (*kä-jär'*), ruling dynasty of Persia, founded by Aga Mahommed, **2738.**

**Kalah** or **Calah,** anc. Assyrian city, built 1300 B.C. by Shalmaneser I; abandoned, then rebuilt as royal residence city about 880 B.C.; excavations revealed much monumental material; **2510.**

**Kalahari** (*kä-lä-hä'rē*) **Desert,** S. Africa, chiefly in Bechuanaland; about 120,000 sq. mi.; **36, 3280,** *map,* **3282;** crossed by Livingstone, **38.**

**Kalamazoo',** Mich. Industrial city in s.w. on Kalamazoo R., about 40 mi. e. of L. Michigan; pop. 48,487; celery-raising, stoves, automobiles, paper; Kalamazoo College.

**Kalamazoo College.** At Kalamazoo, Mich.; co-ed.; Bapt.; chartered 1833 as Michigan and Huron Institute, as college 1855; arts and sciences.

**Kalat** (*kȧ-lät'*) or **Kelat.** Cap. of native state of Kalat in Baluchistan; pop. 18,000; trade center, rapid growth since 1900.

**Kalb, Baron de.** *See in Index* **De Kalb.**

**Kale,** vegetable of cabbage type, **553.**

**Kaleidoscope** (*kȧ-lī'dō-skōp*), **1907.**

**Kal'ends** or **Calends,** first day of Rom. month, **1903.**

**Kalevala** (*kä-lā-vä'lä*), anc. Finnish epic, **1248.**

**Kali** (*kăl'ī*). In Hindu myth., the Black Goddess of murder, death, and plague, patroness of thugs; wife of Siva.

**Kalidasa** (*kä-lē-dä'sȧ*) (3d cent. A.D.?). Greatest dramatic and lyric poet of India and one of great world poets ('Sakuntala').

**Kalix River,** Sweden; flows s.e. 208 mi. to head of Gulf of Bothnia; *map,* **2531.**

**Kal'mar** or **Calmar,** Sweden. Port and cathedral town 200 mi. s. of Stockholm; pop. 17,000; castle dating from 12th cent. the scene of many historic incidents.

**Kalmar, Union of** (1397), **3134, 997, 2536, 3404.**

**Kal'mia,** genus of plants of the heath family; includes mountain laurel, **1970.**

**Kal'mucks,** branch of Mongols, **2286.**

**Kalmuck Steppes,** s. Russia, largely arid plains inhabited by nomadic Tatars engaged in live stock raising, **3084.**

**Kal'somine** or **calcimine,** water-paint, **2642.**

**Kamakura** (*kä-mä-kŭ'rä*), Japan, seacoast village near Yokohama, long center of feudal govt.; colossal image of Buddha, **1874,** *picture,* **1876.**

**Kama** (*kä'mä*) **River,** in e. Russia, largest tributary of Volga; over 1000 mi. long; timber trade; **3660.**

**Kamchatka** (*kȧm-chȧt'kȧ*), peninsula of e. Siberia; 105,000 sq. mi.; pop. 10,000; **1907.**

**Kamehameha** (*kä-mā-hä-mā'hä*) **I** (1753–1819), Hawaiian king; encouraged European commerce; **1605.**

**Kamerun.** Same as **Cameroon.**

**Kam'loops,** British Columbia. A r.r. city on Thompson R., about 160 mi. n.e. of Vancouver; pop. 5000; mining, fruit-growing, ranching, and hunting dist.

**Kampen** (*käm'pĕn*), Netherlands. Town near mouth of R. Yssel; pop. 20,000; formerly a Hanseatic town; 14th cent. town hall and church.

**Kanak'as,** natives of Polynesia, **2620–1, 1605;** *pictures,* **1603, 2621.**

**Kanawha** (*kȧ-nǫ'wȧ*) or **Great Kanawha,** large r. of W.Va. flowing n.w. to Ohio R.; its headstream, the New R., rises in N.C. and flows through w. part of Va.; length 400 mi.; Little Kanawha R. rises in cent. W.Va. and flows w. and n.w. 100 mi. to Ohio R.; **3720,** *map,* **3722;** coal deposits, **3650.**

**Kanazawa** (*kä-nä-zä'wä*). City on w. coast of main isl. of Japan; pop. 159,000; bronze and lacquer work, pottery, silk; fine public gardens.

**Kanchanjanga** or **Kinchinjunga, Mt.** Third highest peak in world (28,156 ft.); one of the e. Himalayas; on boundary between Sikkim and Nepal.

**Kandahar** (*kăn-dȧ-här'*), trade center in Afghanistan, 300 mi. s.w. of Kabul; pop. 32,000; captured by Genghis Khan, Timur, and others; prominent in wars between British and Afghans; **31.**

**Kandy** (*kăn'dī*), Ceylon. Highland town in cent. of isl. on artificial lake; pop. 30,000; cap. of former native kingdom of Kandy; Buddhist and Brahman temples.

**Kane, Elisha Kent** (1820–57). Amer. Arctic explorer and scientist, b. Philadelphia; accompanied and commanded 2d Grinnell expedition; attained Kane Basin (1853) and the then farthest North.

**Kangaroo',** **1907–8;** altitude range, *picture,* **397;** distinguished from other mammals, **2132;** evolutionary position, *diagram,* **128;** foot, *picture,* **1323;** skeleton, *picture,* **3245;** why found only in Australasia, **265–6.**

**Kangaroo rat,** an Amer. rodent with kangaroo-like hind legs, **2977, 2978;** not related to kangaroos, **1908.**

**Kankakee'**, Ill. City 50 mi. s. of Chicago; pop. 16,753; agricultural implements, pianos, furnaces, knitted goods; St. Viator College, Rom. Cath. divinity school, in suburb.

**Kankakee River,** rises in n.w. Ind. and flows s.w. into Illinois; **1757, 1758;** headstream of Illinois R., **1730.**

**Kanpur.** Same as **Cawnpore.**

**Kan'sas,** a cent. state of U.S.; 82,158 sq. mi.; pop. 1,769,257; cap. Topeka; **1909–12,** *maps,* **1910, 3584–5;** agriculture, **1910–1;** chief cities, **1911, 1912;** meaning of name, **3347;** mineral products and mfrs., **1911, 1629;** slavery issue, **1909;** history, **1913, 1027, 516, 522;** state flower, **3347;** surface features and climate, **1909.**

**Kansas, University of,** at Lawrence, Kan.; co-ed.; state institution; founded 1866; arts and sciences, engineering, music, law, pharmacy, medicine; *picture,* **1912.**

**Kansas City,** Kan., largest city in state; pop. 101,177; slaughtering and meat-packing center; **1912.**

**Kansas City,** Mo., 2d city of state; pop. 324,410; slaughtering and meat-packing center; **1912–3;** Cliff Drive, *picture,* **2272.**

**Kansas-Nebraska Act** (1854), **1913;** effects, **2012, 777;** Douglas frames, **1027;** opposed by Sumner, **3392;** supported by Pierce, **2802.**

**Kansas River,** Kan., formed by junction of Solomon and Smoky Hill rivers; with Smoky Hill, traverses entire state to Missouri R.; **2273, 1912.**

**Kansas State Agricultural College,** at Manhattan, Kan.; co-ed.; founded 1863; agriculture, engineering, architecture, home economics, veterinary medicine; students, **1910.**

**Kan'su.** Northwesternmost province of China; 125,450 sq. mi.; pop. 3,900,000; cap. Lanchow; dyes, gold, mercury, silks, musk, tobacco.

**Kant** (*känt*), **Immanuel** (1724–1804), Ger. philosopher, one of greatest of modern times; founder of the "transcendental" or "critical" philosophy; professor at U. of Königsberg ('Critique of Pure Reason'); influence on Ger. literature, **1438.**

**Kantara,** Egypt, town on Suez Canal; r.r. crosses on swinging bridge; **567.**

**Kaolin** (*kā'ō-lĭn*), clay used in pottery, **785, 2883;** how worked, *pictures,* **2519, 3291;** Japanese deposits, **1868;** in S. Carolina, **3292,** *picture,* **3291.**

**Kapp** (*käp*), **Dr. Wolfgang von** (1868–1922). Ger. monarchist, leader of revolt which for a few days in March 1920 put to flight Ebert govt.

**Karachi** (*kä-rä'chē*) or **Kurrachee.** Important seaport and r.r. center at w. end of Indus delta in n.w. India; pop. 152,000; "gateway of cent. Asia"; mfrs., fisheries.

**Karafuto** (*kä-rä-fo͝o'tō*). *See in Index* **Sakhalin.**

**Kara-George** ("Black George") (1766?–1817), nickname given by Turks to George Petrovitch or George Czerny, Serbian peasant, leader of first Serbian war of independence (1804–08) and founder of Kara-Georgevitch dynasty, **3177.**

**Karajich** (*kä-rä'yĭch*), **Vuk Stefanovich** (1787–1864). Father of modern Serbian literature; bent efforts toward adoption of vernacular Serbian as literary language; published folk-songs of the common people; wrote Serbian grammar and dictionary.

**Kara Kirghiz** or **"Black" Kirghiz,** so called from color of their tents; Mongolian race inhabiting highlands of cent. Asia; **226.**

**Karakoram** (*kä-rà-kō'rȧm*) or **Mustagh** (*mus-tăk'*) **Mts.** Range of cent. Asia in n.w. end of Himalayas; highest peak, Mt. Godwin-Austen (28,265 ft.), is 2d highest mt. in world.

**Karakul',** a breed of sheep, **3200;** fur, **1390.**

**Kara** (*kä'rä*) **Sea,** arm of Arctic Ocean between Nova Zembla and n.w. coast of Siberia, **3084,** *map,* **232–3.**

**Kara Strait,** at w. entrance to Kara Sea; reached by Hudson, **1690.**

**Karat.** Same as **Carat.**

**Karikal** (*kä-rē-käl'*), Fr. settlement on s.e. coast of India; 53 sq. mi.; pop. 56,000; chief town, Karikal (pop. 19,000); **1756.**

**Karlowitz** (*kär'lō-vits*) or **Carlowitz,** Jugo-Slavia (formerly in Austria-Hungary). Town on Danube R., 40 mi. n.w. of Belgrade; peace between Turkey, Austria, Poland, Venice, and Russia signed here (1699).

**Karlsbad** (*kärls'bät*), **Carlsbad,** or **Karlovy Vary,** Czecho-Slovakia, famous watering place 78 mi. w. of Prague; pop. 17,500; **3331.** Karlsbad decrees issued here (1819) put univs. and press under strict censorship to suppress liberal agitation.

**Karlskrona** (*kärls-krō'nȧ*) or **Carlscrona,** Sweden, port on Baltic, 238 mi. s.w. of Stockholm; pop. 30,000; Swedish naval headquarters, fine deep harbor, arsenals, shipyards; exports fish, stone, iron, lumber; **3403.**

**Karlsruhe** (*kärls'rų-ē*) or **Carlsruhe,** Germany. Cap. of republic of Baden, 39 mi. n.w. of Stuttgart; pop. 136,000; locomotives, machinery, wagons.

**Kar'ma,** in Hinduism, **1651.**

**Karnak** (*kär'năk*), village on Nile in Upper Egypt on n. part of site of anc. Thebes; remains of Temple of Ammon, greatest of all known temples, **1104,** *pictures,* **1105, 1101, 1103, 1104, 178,** color plate facing **176.**

**Karna'tak** or **Carnatic,** region along e. coast of s. India, **1746, 1753.**

**Karolyi** (*kä'rō-lyē*), **Count Michael** (born 1875). Provisional pres. of the Hungarian People's Republic (Nov. 1918–March 1919); handed reins to Soviet govt. because unable to make headway against stern Allied terms.

**Karoo'** or **Karroo,** barren tablelands in S. Africa, **36, 3279, 3283.**

**Kars,** town of Transcaucasia about 100 mi. s.e. of Batum; pop. 35,000; Mohammedan holy city, with 11th cent. 'Cathedral of the 12 Apostles'; cap. of a medieval Armenian principality; several times besieged in wars between Russia and Turks; r.r. connection, **664.**

**Karshi** (*kär-shē'*). Commercial center of Bokhara, cent. Asia, 96 mi. s.e. of city of Bokhara; pop. 25,000; meeting point of several important roads; market where Turkomans and Uzbegs sell carpets, knives, and firearms; fine tobacco and poppies.

**Kaschau** (*kä-shou'*). Same as **Kassa.**

**Kashgar** (*käsh-gär'*) or **Cashgar,** commercial center in w. Chinese Turkestan, 100 mi. n.w. of Yarkand; pop. 60,000; textiles; gold and silver articles; **3555, 228.**

**Kashga'ria** or **Chinese Turkestan, 3555.**

**Kashmir.** Same as **Cashmere.**

**Kaskas'kia,** Ill., early Fr. settlement in s.w. on Mississippi R. (1700); Geo. R. Clark captures, **783, 3004;** cap. of Ill. (1809–20), **1736.**

**Kaskaskia River,** in s. Ill.; about 300 mi. long; enters Mississippi at Chester; *map,* **1731.**

**Kas'sa, Kaschau,** or **Kosice,** Czecho-Slovakia. Beautiful old city, 130 mi. n.e. of Budapest; pop. 41,000, mostly Magyars and descendants of Germans who founded city before 12th cent.; chief commercial and political town of Upper Hungary; magnificent 14th cent. Gothic cathedral; mineral springs near by.

**Kassai** (*kä-sī'*) **River,** rises in n.c. Angola and flows n.w. 1000 mi. to Congo R., **859.**

**Kas'sel,** Germany. Same as **Cassel.**

**Kassites** (*kä-sīts'*), Elamite tribe which overran Babylonia in 18th cent. B.C. and founded dynasty, **1655.**

**Kas'tro,** formerly Rhodes, cap. of isl. of Rhodes; founded 408 B.C.; walls and old stone houses preserve medieval appearance; trade center, **3011.**

**Kastro,** island. *See in Index* **Mytilene.**

**Katahdin** (*kȧ-tä'dĭn*), **Mt.** (Indian "big mountain"). Bare granite peak in e. Maine, highest point in state (5200 ft.).

**Katherine of Valois** (1401–37), daughter of Charles VI of France and queen of Henry V of England, **1700, 1634, 694.**

**Katmai** (*kȧt'mī*), **Mt.,** volcano of Aleutian Range in n. of Alaskan Peninsula; height 7500 ft.; **77.**

**Kato** (*kä'tō*), **Takaaki, Viscount** (born 1859). Japanese statesman, ambassador to Gt. Brit. 1894–99, 1908–13; four times foreign minister; leader of the Constitutionalist party.

**Kato, Tomosaburo, Baron** (born 1859). Japanese admiral and statesman; commanded fleet which attacked Germans at Tsing-Tao in 1914; delegate to Washington Limitation of Armament Conference 1921; premier 1922.

**Kat'rine, Loch,** lake of Perthshire, Scotland; 5 sq. mi.; **1470.**

**Katsura** (*kä'tsų-rä*), **Taro, Prince** (1847–1913). Japanese statesman, gov. of Formosa, minister of war, then premier 1901–06; again premier 1908–11 and 1912–13; accomplished various financial reforms, annexation of Korea, revision of commercial treaties with western powers, Anglo-Japanese alliance; advocated constitutional development of Japan.

**Kat'tegat** or **Cattegat,** strait between Denmark and Sweden; 150 mi. long, greatest width 90 mi.; **2528, 321,** *map,* **997.**

**Ka'tydid,** green insect of the grasshopper family, **1913–4;** protective coloring, **2924.**

**Katzbach** (*käts'bäk*) **River.** Tributary of Oder in Prussian Silesia; on its banks Prussians under Blücher defeated French under Marshal Macdonald (1813).

**Kauai** (*kou-ī'*), one of Hawaiian isls., 547 sq. mi., **1604.**

**Kauffmann** (*kouf'män*), **Angelica** (1741–1807). Swiss portrait painter, whose beauty and charming personality enhanced the reputation of her graceful but poorly drawn pictures; friend of Goethe, Reynolds, and other famous men.

**Kaulbach** (*koul'bäk*), **Wilhelm von** (1805–74), Ger. (Munich) fresco and historical painter and book illustrator, first and most celebrated of a family of painters; illustrated 'Reynard the Fox'; picture by, **2988.**

**Kaunitz** (*kou'nĭts*), **Prince Wenzel Anton von** (1711–94), Austrian statesman, minister of Maria Theresa, **3180, 2147.**

**Kauri** (*kou'rī*) **gum,** the resin, usually fossilized, of kauri pine, **1552;** in linoleum, **2018;** New Zealand supply, **2499;** in varnish, **2643.**

**Kava** (*kä'vȧ*) or **ava,** a shrub of the pepper family from which an intoxicating beverage is prepared in the South Sea Isls.
**Kavele.** Same as **Ujiji.**
**Kay, Sir,** one of knights of Round Table, **3069.**
**Kayak** (*kī'ăk*), Eskimo skin-boat, **445, 1177, 1539,** *picture,* **443.**
**Kazan** (*kȧ-zän'*), mfg. and commercial center in e. Russia, 450 mi. e. of Moscow; pop. 195,000; cap. of anc. Tatar kingdom, taken by Russians 1552; univ.; **3660.**
**Kazan Cathedral,** at Petrograd, **2749.**
**Kazan Defile,** on Danube R., **962.**
**Kaz'bek** or **Kasbek, Mt.,** one of highest peaks of Caucasus Mts., 90 mi. s.e. of Mt. Elbruz, **663.**
**Kazvin** (*käz-vēn'*). Town in Persia, 92 mi. n.w. of Teheran; pop. 40,000; trade in rice, fish, raisins, silk; remains of old walls and buildings shattered by earthquakes.
**Ke'a,** a sheep-killing parrot, **2690.**
**Kean, Edmund** (1787–1833). Eng. Shakespearean tragedian; "seeing him act was like reading Shakespeare by flashes of lightning" ('Shylock'; 'Othello'; 'Richard III').
**Kearny** (*kär'ni*), **Philip** (1815–62). Amer. brig.-gen. and cavalry leader; captain in Mex. War; served twice in Fr. cavalry to study methods; commanded brigade, then divison, in Civil War; killed at Chantilly; nephew of Gen. S. W. Kearny.
**Kearny, Stephen Watts** (1794–1848), Amer. maj.-gen.; served in War of 1812; occupied N.M. during Mex. War, **2467, 2208.**
**Kearny,** N.J. Residential suburb of Newark and New York City on Passaic R.; pop. 26,724; linoleum, cotton and linen thread, celluloid, etc.; named for Gen. Philip Kearny.
**'Kearsarge',** U.S. cruiser, **73.**
**Keats, John** (1795–1821). Eng. poet, **1914, 1166;** quoted, **2029, 2508;** Shelley's elegy, 'Adonais', **3204.**
**Keble** (*kē'bl*), **John** (1792–1866). Eng. poet and clergyman; professor of poetry at Oxford for 10 years; Keble College built as a memorial to him ('The Christian Year').
**Keble College,** Oxford, **2610.**
**Kebnekaise** (*chēb'nē-kī-sē*). Highest peak in Sweden, in Kiolen Mts. (7005 ft.).
**Kecskemet** (*kĕch'kĕ-māt*). Hungarian city 65 mi. s.e. of Budapest; pop. 69,000, mostly Magyars; cattle market; trade in apples, apricots, flour, wine.
**Ke'dah,** native state in w. of Malay Peninsula; 3800 sq. mi.; pop. 250,000; **2130.**
**Keel,** the lengthwise timber or structure at the bottom of a ship, **3216–7,** *pictures,* **3211, 3213.**
**Keel, false.** An extra keel, often weighted, below the true keel of a ship, to help strengthen and stabilize the vessel.
**Keel'ing Islands.** Same as **Cocos Islands.**
**Keel Mts.** Same as **Kiolen.**
**Keelson.** A timber or beam bolted over a ship's keel to help stiffen the vessel.
**Keene, Charles Samuel** (1823–91). Eng. pen-and-ink artist, for 40 years a contributor to *Punch;* foremost among Eng. craftsmen in black and white, but work has never been popular because of its unconventionality.
**Keene, Laura** (1820–73). Anglo-Amer. actress and manager; her company was playing 'Our American Cousin' at Ford's Theater, Washington, when Lincoln was assassinated.
**Keene,** N.H., industrial city on Ashuelot R., 43 mi. s.w. of Concord; pop. 11,210; noted for its mfrs. of woodenware; **2456.**
**Keep,** of castle, inmost and strongest part, **656,** *picture,* **655.**
**'Keeping Our Word',** a Little Talk by Arthur Mee, **1915.**
**Keewatin** (*kē-wä'tĭn*), Canada, district of, **2528,** *map,* **602–3.**
**Keijo** (*kā-jō'*). Same as **Seoul.**
**Keiogijuku University,** Tokyo, **3511.**
**Keith, Francis Edward James** (1696–1758). Scotch soldier, Jacobite adherent, field marshal under Frederick the Great in Seven Years' War; resolute and prompt in action, skilful in tactics.
**Kekulé** (*kā'kŭ-lā*) or **Kekulé von Stradonitz, Friedrich A.** (1829–96). Ger. chemist; devised "graphic formulae" for organic chemistry and discovered molecular structure of benzene; chemistry of explosives, dye-stuffs, and coal-tar products based largely upon his researches.
**Ke'lantan,** state of Malay Peninsula; 5870 sq. mi.; pop. 287,000; **2130.**
**Kelim rugs, 3077.**
**Keller, Gottfried** (1819–90), Ger. poet and novelist, b. Switzerland; **2541;** chief works, **1438.**
**Keller, Helen** (born 1880), Amer. author; born blind, deaf, and dumb; **1916.**
**Kel'lermann, François Christophe de** (1735–1820). Fr. Revolutionary general, marshal of France, victor at Valmy (1792) over Prussians; father of François Etienne de Kellermann, one of Napoleon's ablest generals.
**Kellogg, Clara Louise** (1842–1916). Amer. operatic soprano, b. Sumterville, S.C.; extensive repertoire; toured U.S. with her own company.
**Kellogg, Elijah** (1813–1901), Amer. minister and writer for the young, b. Portland, Me.; 'Spartacus to the Gladiators', **3310.**
**Kells,** Ireland, old town in County Meath, on the Blackwater; noted for antiquities, especially St. Columbkille's (Colomba's) house; anc. cross, *picture,* **1808.**
**Kelly, William** (1811–88), Amer. inventor, **1824.**
**Kelmscott Press, 2329.**
**Kelp,** any large coarse seaweed **3170, 3171;** classified among algae **2822;** iodine from, **1802;** potash from, **2900, 1235,** *pictures,* **2899.**
**Kel'pies,** water fairies, **1219.**
**Kelts.** Same as **Celts.**
**Kel'vin, William Thomson,** first **Baron** (1824–1907), Brit. physicist, **1121–2;** electrical engineer for first Atlantic cable, **557–8, 560–1;** studied age of earth, **1060.**
**Kemal Pasha, Mustapha** (born 1879). Turkish nationalist leader, active in Young Turk movement; held high commands in World War; organized and headed rebel Nationalist govt. in Angora 1920 and swept Greek forces from Asia Minor 1922.
**Kem'ble.** Famous family of Eng. actors; most celebrated members were Mrs. Siddons, her brothers John Philip and Charles, and her niece Fanny.
**Kemble, Fanny** (Frances Anne) (1809–93). Eng. actress and author, daughter of Charles Kemble ('Journals', interesting picture of Amer. life).
**Kemeys** (*kĕm'ēs*), **Edward** (1843–1907). Amer. wild-animal sculptor, b. Savannah, Ga.
**Kemmel, Mont.** Isolated rocky hill near village of same name, 6 mi. s.w. of Ypres; overlooked Flanders plain to n.e. and s.e.; taken by Germans April 25, 1918.
**Kempe, William,** Eng. actor of Shakespeare's time, **3190.**
**Kem'pis, Thomas à** (1380?–1471). Ger. monk and mystic, remembered for one book, the 'Imitation of Christ', a classic of devotional literature.
**Ken, Thomas** (1637–1711). Eng. bishop, one of the "fathers of modern hymnology" ("Praise God from Whom All Blessings Flow"; "Awake, My Soul, and with the Sun").
**Kendall, Henry Clarence** (1841–82), Australian poet, **268.**
**Kendrick, John** (1745?–1800), Amer. navigator, b. Boston, d. Hawaii; explored n.w. coast of America and Pacific isls.; enters Columbia R., **2596.**
**Ken'esaw Mountain.** A height 25 mi. n.w. of Atlanta, Ga., where Confederates repulsed Sherman's army, inflicting heavy losses June 27, 1864.
**Ken'ilworth,** England. Small town in Warwickshire; ruins of castle given by Queen Elizabeth to Earl of Leicester; scene of Scott's novel 'Kenilworth'.
**Ken'nan, George** (born 1845). Amer. traveler, writer, and lecturer, b. Norwalk, Ohio; telegraphic engineer and explorer in Russia and Siberia ('Siberia and the Exile System'; 'Campaigning in Cuba'; 'Edward H. Harriman', a biography).
**Kennebec** (*kĕn'ē-bĕk*) **River,** 2d largest r. of Maine; rises in Moosehead L., flows s. 140 mi. to Atlantic; **2126.**
**Kennedy, Charles Rann** (born 1871). Actor and dramatist, b. England but resides in U.S.; husband of Edith Wynne Matthison; plays are serious and religious in tone ('The Servant in the House'; 'The Terrible Meek').
**Kenneth I, MacAlpine** (d. 860?), king of the Scots and conqueror of the Picts, often called first king of Scotland, **3148.**
**Keno'sha,** Wis., mfg. city and port on s.w. shore of L. Michigan, 33 mi. s. of Milwaukee; pop. 40,472; manufactures, **3771–2.**
**Ken'sington,** borough of w. London, England; pop. 176,000; Kensington Palace (birthplace of Victoria) and Gardens; residence of Thackeray; Albert Memorial, *picture,* **2050.**
**Kent, Edward Augustus, Duke of** (1767–1820), Eng. prince, 4th son of George III; father of Queen Victoria, **3639.**
**Kent, James** (1763–1847). Amer. jurist and author; his 'Commentaries upon American Law' is a legal classic which has exerted an influence comparable to that of Blackstone's 'Commentaries'.
**Kent,** s.e. county of England; 1555 sq. mi.; pop. 1,047,000; called "garden of England" from its rich soil and picturesque scenery; first landing-place of Anglo-Saxon invaders; **1160;** Christianity introduced, **636;** Canterbury cap. of early kingdom, **637.**
**Kent Island,** largest isl. in Chesapeake Bay, Md., 7 mi. e. of Annapolis; oyster fisheries; first settlement in Md., **2163.**
**Kentuck'y,** an e.-cent. state of U.S.; 40,598 sq. mi.; pop. 2,416,630; cap. Frankfort; **1916–20,** *maps,* **1917, 3584–5;** agriculture, **1916–8;** chief cities, **1918, 2073;** hemp industry, **1917, 1630;** history, **1919–20, 464, 14;** horse breeding, **1917, 1918;** meaning of name, **3347;** minerals, **1919;** state flower, **3347;** surface, **1916, 1919;** tobacco production, **3508, 3509.**
**Kentucky, The State University of,** At Lexington, Ky.; co-ed.; founded 1865; agriculture, engineering, law, arts and sciences, extension work.

**Kentucky Resolutions, 14, 3347.**

**Kentucky River,** in Ky., formed by several forks, rising in Cumberland Mts. of s.e.; flows 250 mi. n.w. to Ohio R.; navigable to Frankfort; **2573.**

**Kenya, Mt.** Volcanic peak in Brit. E. Africa (17,200 ft.); discovered 1849; first ascended 1899.

**Kenya Colony.** Same as **British East Africa Protectorate.**

**Ken'yon College.** At Gambier, Ohio; men; founded 1824 (at Worthington, moved 1827 to Gambier); Prot. Episc.; arts and sciences, theology.

**Ke'okuk,** Iowa, jobbing and mfg. city on Mississippi and Des Moines rivers in s.e. corner; pop. 14,423; lumber, powder, canned goods, starch, oatmeal, chemicals; dam, **1804, 1806,** *picture,* **1805.**

**Kephart, Horace,** camping expert, quoted, **596;** ration list, **599.**

**Kep'ler, Johann** (1571–1630), Ger. astronomer who formulated laws of planetary motion, **1920–1.**

**Kepler's laws, 1921.**

**Ke'rak.** An independent Arab principality (since 1920), also called Transjordania; extends e. from the Jordan into the desert.

**Kerbela** (*kĕr'bĕ-lä*). Town in s. Mesopotamia, 60 mi. s.w. of Bagdad; pop. 65,000; sacred city and place of pilgrimage of Shiite Moslems; tomb of martyr Husein.

**Keren'sky, Alexander Feodorovitch** (born 1881), Rus. revolutionary statesman, head of the provisional govt. of 1917, **3095.**

**Kerguelens** (*kĕr'gĕ-lĕns*) **Land.** A desolate uninhabited volcanic isl. 85 mi. long on s. border of Indian Ocean midway between Cape of Good Hope and Australia; Fr. possession.

**Kerman** (*kĕr-män'*) or **Kirman,** Persia, in s.e.; cap. of province of same name; pop. 70,000; **2734.**

**Kermanshah** (*kĕr-män-shä'*), Persia, cap. of province of same name in w. Persia; pop. 80,000; on high road between Bagdad and Teheran; ruined walls; **2734.**

**Kern River,** stream rising in mts. of s.e. Calif.; flows s.w. and n. to L. Tulare; **3736.**

**Ker'osene,** an illuminating oil distilled from coal or petroleum; distillation, **2754;** first used, **2749;** in lighting, **1959;** removes rust, **3099;** in soaps, **3267.**

**Kerosene emulsion, 3331.**

**Ker'ry.** County of s.w. Ireland in province of Munster; 1811 sq. mi.; pop. 160,000; beautiful mt. scenery; lakes of Killarney.

**Kertch** (*kĕrch*) or **Kerch,** Russia, Crimean port between Black and Azof seas; pop. 56,000; iron mining; suffered in Crimean War.

**Kes'trel.** A bird of prey, one of the smallest of the true falcons (*Falco tinnunculus*) widely distributed through the Old World; it resembles the common sparrow hawk of America to which it is closely related; a strong flier, distinguished from other falcons by its habit of hovering in one spot.

**Kettledrum, 1042, 2591,** *picture,* **2382.**

**Kewanee** (*kē-wä'nē*). Ill. Mfg. city 41 mi. n.w. of Peoria, with coal-mining interests; pop. 16,026; fittings, valves, tubes, boilers, radiators, agricultural implements.

**Kewau'nee,** Wis., port on L. Michigan 25 mi. e. of Green Bay; pop. 1865; important shipping point; car ferry, **2227, 2967.**

**Keweenaw** (*kē'wē-nạ*) **Bay,** inlet of L. Superior in n. peninsula of Mich., **3397,** *map,* **2226.**

**Key** (*kī*), **Ellen** (born 1849). Swedish social writer and feminist ('The Century of the Child'; 'The Woman Movement').

**Key** (*kē*), **Francis Scott** (1780–1843), American lawyer; writes 'Star Spangled Banner', **2405.**

**Key,** sending instrument in telegraphy, **3456.**

**Keyhole limpet.** Limpet with hole at tip of shell.

**Keys, Florida, 1921, 884.**

**Keys, House of, 2134.**

**Keys and locks, 2042–3.**

**Keystone,** in arch, **174.**

**Keystone State, 2717.**

**Key West,** Fla., winter and health resort on isl. about 100 mi. n. by e. of Havana, Cuba; pop. 18,749; **1921, 1298, 1300.**

**Key West Railroad, 1921, 506.**

**Khadija** (*kä-dē'jä*), wife of Mohammed, **2275.**

**Khafre** (*kä'frā*), also **Khafra** or **Chephren,** Egypt. king of 4th dynasty (2800–2700 B.C.?); pyramid of, **2939, 1100,** *picture,* **2940;** Sphinx, portrait, **1100.**

**Khaki** (*kä'kī*), a light drab cotton material, **3575, 3578.**

**Khalkis,** Greece. Same as **Chalcis.**

**Khan** (*kän*), in Orient, unfurnished inn for traders and their trains; in Damascus, **956;** in Greece, **1527.**

**Kharbin,** China. Same as **Harbin.**

**Kharga** (*kär'gä*), oasis in Libyan desert, **1093.**

**Kharkof** (*kär-kōf'*), industrial city in Ukraine 250 mi. e. of Kief; pop. 259,000; univ; live stock fairs; **3575.**

**Khartum** (*kär-tụm'*), cap. of Anglo-Egyptian Sudan at union of Blue and White Niles; pop. 23,000; trade center on Cape to Cairo R.R.; Gordon College; **1093,** siege of, **1489;** Kitchener captures, **1929.**

**Khedive** (*kē-dēv'*), Turkish viceroy in Egypt, **1097.**

**Kherson** (*kĕr-sōn'*) port on Dnieper in s. Russia, 100 mi. e. of Odessa; pop. 99,000; grain and woolen mills, tobacco mfrs.; inland trade tributary to Odessa; **434.**

**Khingan** (*kĭn-gän'*), mt. range in China; Great Khingan in e. Mongolia and n.w. Manchuria; continuation in n.e. Manchuria s. of the Amur known as Little Khingan; **2135, 2285.**

**Khiva** (*kē'vä*), state in cent. Asia, s. of Aral Sea; 24,000 sq. mi.; pop. 646,000; formerly khanate, vassal of Russia; Soviet govt. established after Rus. Rev.; silk and cotton; **3555, 3556.**

**Khiva,** cap of state of Khiva; pop. 5000; four Mohammedan colleges; **228.**

**Khokand** (*kō-känd'*) or **Kokand,** trade center in Rus. Turkestan 275 mi. e. of Bokhara; pop. 100,000; **3556.**

**Khorasan** (*kō-rä-sän'*), mountainous province of n.e. Persia, **2735;** rainfall, **2973.**

**Khorsabad** (*kôr-sä-bäd'*), village near site of anc. Nineveh; remains of Assyrian art found in 1843–55; Sargon's palace at, *picture,* **295.**

**Khotan** (*kō-tän'*), Chinese Turkestan, trade city in s.w.; pop. 30,000; **3555;** bazaars, **228.**

**Khufu** (*kụ'fụ*) or **Cheops** (about 2800 B.C.), Egypt. king of 4th dynasty; Great Pyramid, **1100, 2939, 2940,** *picture,* **570.**

**Khyber** (*kī'bĕr*) or **Khaibar Pass,** narrow mt. pass between India and Afghanistan; length 33 mi.; great strategic importance for 2000 years; now under Brit. control, **31, 1744.**

**Kiang** (*kī-äng'*), wild animal of Asia, resembling both ass and horse, **235. 1684.**

**Kiangsi** (*kī-äng-sē'*). An inland province of China; 69,400 sq. mi.; pop. 16,255,000; cap. Nanchang; coal, iron, copper, tea, tobacco, silk.

**Kiangsu'.** A maritime province of cent. China; 38,600 sq. mi.; pop. 15,380,000; cap. Nanking; chief city Shanghai; one of China's richest and most fertile regions.

**Kiaochow** (*kī-ou-chou'*), town, bay, and dist. on e. coast of Chinese province of Shantung; held by Japan, **3195–6, 1870,** *picture,* **3196.**

**Kickapoo' Indians,** tribe of Algonquian stock first known in cent. Wis.; moved s. into Wabash region of Ind. and Ill.; **1765, 723.**

**Kicking Horse Pass.** In Rocky Mts. of e. Brit. Columbia; 5296 ft. high; traversed by Kicking Horse R.; magnificent scenery.

**Kid,** goatskin leather, forms of, **1977, 1477;** in glove mfr., **1474–5;** in shoe mfr., **3222.**

**Kidd, Benjamin** (1858–1916). Eng. sociologist; his 'Social Evolution' (1894) is one of the most widely read books in its field, having been translated into many languages.

**Kidd, Captain William** (1650?–1701), Brit. pirate, **1921–2.**

**Kid'derminster,** England. Town in Worcestershire on Stour R.; pop. 25,000; noted for mfr. of carpets.

**Kidderminster carpet, 3079.**

**'Kidnapped',** adventure story by Robert Louis Stevenson, **3356.**

**Kidney bean,** kidney-shaped seed of any plant of the common bean type, **347.**

**Kidney** or **Peruvian cotton,** a type whose seeds grow in a kidney-shaped mass, **904.**

**Kidneys,** in human body, **1922, 1469.**

**Kido** (*kē'dō*), **Takayoshi** (1832–77). Japanese statesman, called "the pen of the revolution of 1868," advocate of western civilization and constitutional govt.; founder of first real Japanese newspaper.

**Kidron** (*kid'rŏn*), **Kedron,** or **Cedron, Valley of,** deep depression e. of Jerusalem where brook flowed in anc. times; several times referred to in Bible; **1885.**

**Kief** (*kē'yĕf*) or **Kiev,** cap. of the Ukraine; pop. 600,000; **1922;** in Middle Ages, **3089, 3096.**

**Kieffer pear,** type suited for cooking, **2701.**

**Kiel** (*kēl*), Germany, chief naval port of Germany on Baltic; pop. 206,000; shipyards, iron mfrs.; univ.; terminus of Kiel Canal; scene of Ger. naval mutiny in 1918; **1440.**

**Kiel Canal, 626,** *map,* **1440;** protected by Helgoland, **1629;** in World War, **3796, 321.**

**Kielce** (*kyĕl'tsĕ*), Poland, city in mts. 95 mi. s. of Warsaw; pop. 44,000; formerly noted for copper mines, no longer worked; mfrs. of hemp, brick, paint; **2857.**

**Kieselguhr** (*kē'zĕl-gụr*), an absorbent earth, **1050.**

**Kilauea** (*kē-lou-ā'ä*), Hawaii, **1604, 3660,** *pictures,* **1602, 1972, 3658, 3660.**

**Kildare** (*kĭl-dâr'*). Old town in Ireland, 30 mi. s.w. of Dublin; pop. 3000; originated in nunnery founded 5th cent by St. Bridget; cap. of County Kildare (area 654 sq. mi.; pop. 66,000).

**Kilimanjaro** (*kĭl-ĭ-män-jä'rō*), double-peaked volcanic mt. (19,780 ft.) in n. of Tanganyika Territory (formerly Ger. E. Africa), **34, 1069.**

**Kilken'ny.** Town in Ireland, 65 mi. s.w. of Dublin; pop. 11,000; 2d largest cathedral in Ireland; cap. of Kilkenny County (800 sq. mi.; pop 75,000); the story of the Kilkenny cats which fought until nothing but their tails were left is said to be a satire on the long-standing boundary dispute between Kilkenny and its neighbor Irishtown.

**Killarney** (*kĭ-lär'nĭ*), Ireland. Small market town in s.w. in County Kerry, near Killarney Lakes.
**Killarney Lakes, 1807,** *picture,* **1811.**
**Killdeer** or **killdee,** a N. Amer. type of plover, **2839,** *pictures,* **414, 2410;** nests on ground, **406;** protective coloration, **2924.**
**Killiecrankie** (*kĭl-ĭ-krăn'kĭ*). Pass in Perthshire, Scotland; Viscount Dundee, leader of Jacobite Highlanders, killed in victory over royal forces in 1689.
**"Kilmainham Treaty,"** agreement between Gladstone and Parnell, signed at Kilmainham, suburb adjoining Dublin on the w., **2690.**
**Kilmarnock** (*kĭl-mär'nŏk*), Scotland. Town on Kilmarnock Water, in Ayrshire, 20 mi. s.w. of Glasgow; pop. 38,000; textiles, machinery, cheese; first edition of Burns' poems published here (1786).
**Kil'mer, Joyce** (1886–1918), Amer. poet, killed in France in World War; poem 'Trees', **173.**
**Kiln** (*kĭl*), oven for burning or baking industrial products; brick, **504;** cement-burners, **676,** *picture,* **675;** pottery, **2905,** *picture,* **2907.**
**Kil'ogram,** a unit in the metric system (2.204 lbs.), **2206;** international standard, *picture,* **3714.**
**Kil'oliter,** a unit in the metric system (264.17 gals.), **2206.**
**Kil'ometer,** a metric unit of length (3280 ft.), **2206.**
**Kil'owatt,** practical unit of electric power, equal to 1000 watts, roughly 1⅓ horse-power, **1116, 1052.**
**Kilpat'rick, Hugh Judson** (1836–81). Union general in Civil War; one of most brilliant cavalry leaders; commanded cavalry of Sherman's army 1864 in march from Atlanta to Savannah.
**Kilt, 897,** *picture,* **3146.**
**'Kim',** novel by Kipling in which the hero, nicknamed 'Kim', a precocious little Irish vagabond, roams through India with a Tibetan priest, **1927.**
**Kim'berley,** S. Africa, diamond-mining center, Cape of Good Hope province; pop. 17,000 (white); besieged in Boer War (1899–1900), **3011;** diamond mines, **3281, 1001,** *pictures,* **1002, 1003.**
**Kimo'no,** Japanese garment, **1871,** *pictures,* **1870, 1871.**
**Kinchinjunga, Mt.** Same as **Kanchanjanga.**
**Kin'dergarten, 1923–5, 3140, 3141;** founded by Froebel, **1372;** Montessori method, **2313–6;** training the eye, **1216.**
**Kinemat'oscope, 2352.**
**Kinet'ics,** branch of mechanics treating of bodies in motion, **2189.**
**Kinetic theory,** of gases, **1403.**
**Kinet'oscope, 2352.**
**King, (William Benjamin) Basil** (born 1859), Canadian poet and novelist; numerous romances with strong religious undertone ('The Inner Shrine'; 'Wild Olive'; 'The Street Called Straight'; 'The City of Comrades'); **624.**
**King, Rufus** (1755–1827), Amer. statesman, b. Scarborough, Me.; member of Federal constitutional convention, senator and minister to England; **2306.**
**King, William Lyon Mackenzie** (born 1874). Canadian statesman and economist, b. Kitchener, Ontario; grandson of W. L. Mackenzie; minister of labor 1909–11; economic research for Rockefeller Foundation 1914; premier of Canada 1921.
**King, William Rufus** (1786–1853), Amer. statesman, b. Sampson County, N.C.; House of Representatives 1810–16; U.S. senator 1819–44; vice-president of U.S., **2802, 3636.**
**Kingbird,** a type of flycatcher, **1925, 1313–4,** *picture,* **417.**
**King bird of paradise,** color plate facing **2676.**
**King cobra,** or hamadryad, a large cobra-like snake, **817.**
**King crab,** a crab-like creature, *picture,* **913;** classification disputed, **3945;** possibly descended from trilobites, **1336.**
**King Edward VII Land, 145, 3150,** *map,* **144.**
**Kingfisher,** a fish-eating bird, **1925,** *picture,* **417;** adaptation, **1076;** belongs to cuckoo order, **939;** female brightly colored, **411.**
**King George's War,** name given by the Eng. colonists to the conflict in America between French and English 1744–48 (in Europe it was called War of the Austrian Succession), **1664, 4, 1362.**
**King Haakon Plateau,** at South Pole, **2864.**
**King James Version** of Bible, **389, 1860.**
**'King Lear',** tragedy by Shakespeare, **1926, 3191;** quotations from, **3193.**
**Kinglets,** various tiny insect-eating birds, **1926,** *picture,* **420.**
**"King-Maker, The," 3066.**
**King Philip's War** (1675–76), led by King Philip, chief of Wampanoag Indians, against New England colonists, **1772, 3332.**
**King rail,** *picture,* **2961.**
**Kings.** Eleventh and twelfth books of the Old Testament, usually written I Kings and II Kings, dealing with the period that embraces the reigns of all the kings of Israel except Saul and David.
**King** or **chinook salmon, 3113.**
**King's Bench, Court of,** in England, **909.**
**Kings Borough,** part of New York City, **2498.**
**King's Chapel,** Boston, **472.**
**King's College,** N.Y., now Columbia Univ., **2491.**
**Kings College, University of.** At Windsor, Nova Scotia; co-ed.; Anglican; founded 1788 (as academy, chartered 1802); arts, science, law, theology.
**King's Highway** or **Camino Real,** in s.w. U.S., **3024.**
**Kingsley, Charles** (1819–75), Eng. clergyman and author, whose wide sympathies, especially with the poor, in his day labeled him radical ('Westward Ho' and 'Hypatia', historical novels; 'Yeast' and 'Alton Locke', novels of social propaganda; 'Water Babies', classic fairy tale); **2540, 3400.**
**Kings Mountain,** ridge between N.C. and S.C., 30 mi. s.w. of Charlotte, N.C.; brilliant victory of Americans over British Oct. 1780, **3004, 3181, 3292.**
**King snake, 3261, 3258,** *picture,* **3257.**
**King'ston, Charles Cameron** (1850–1908). Australian statesman; premier of S. Australia 1893–99; instrumental in passage of radical laws on woman suffrage, land, and labor questions.
**Kingston,** Jamaica, on s. coast, cap., chief port, and r.r. center; pop. 58,000; **1859.**
**Kingston,** N.Y. City on Hudson R., 55 mi. s. of Albany; pop. 26,668; trade in coal, stone, brick, lime, cement, lumber, and farm products; r.r. shops, steamboat plants, lace mills; founded by Dutch 1652; first state constitutional convention and temporary cap. 1777; burned by British same year.
**Kingston,** Ontario, at n.e. end of L. Ontario, historic city commanding entrance to St. Lawrence R.; pop. 24,000; **1926, 3108, 2604.**
**Kingston-upon-Hull.** *See in Index* **Hull.**
**Kingstown,** Ireland. Seaport and watering place on s. shore of Dublin Bay, 7 mi. s.e. of Dublin; pop. 17,000.
**Kingtehchen** (*kĭng-tā-chĕn'*). Large mart of s.e. China, in province of Kiangsi on R. Chang; pop. more than 100,000; great porcelain center.
**King vulture,** *picture,* **410.**
**King William Land,** in Greenland, **120,** *map,* **1540.**
**King William's War** (1689–97), part of Anglo-French struggle for N. Amer., **1664, 3136, 1362.**
**Kinlochleven,** Scotland, hydroelectric installation, *picture,* **3694.**
**Kinnickinnic** (*kĭn-ĭ-kĭ-nĭk'*) **River,** in Wis., **2246.**
**Kin'zie, John** (1763–1828), Amer. pioneer, b. Quebec, Canada; first white settler of Chicago, **725.**
**Kiolen** (*kyû'lĕn*), **Kjölen,** or **Keel Mts.,** between Sweden and Norway, **2529, 2532, 3401,** *map,* **2531.**
**Kioto,** Japan. Same as **Kyoto.**
**Ki'owas,** Indian tribe, formerly in Okla., Colo., and N.M.; now only about 1000 left in Okla.; **844.**
**Kipchaks** (*kĭp-chäks'*), branch of Mongols, **2285.**
**Kip'ling, John Lockwood** (1837–1911), Brit. artist and educator in India; father of Rudyard Kipling, **1926.**
**Kipling, Rudyard** (born 1865), Eng. writer, famous for stories of India, **1926–7, 1167;** limerick quoted, **2010;** Nobel prize-winner, **2513;** and Roosevelt, *picture,* **3061;** 'The Story of Mowgli', **1927–9.**
**Kippered herring, 1190.**
**Kirby, William** (1817–1906), Canadian novelist, b. in England, **624.**
**Kirchhoff** (*kĭrĸ'hŏf*), **Gustav Robert** (1824–87). Ger. physicist; developed spectrum analysis (with Bunsen).
**Kirghiz** (*kĭr-gēz'*), nomadic people of cent. Asia, of Turko-Tataric (Mongolian) race, ranging from borders of European Russia to w. China, **1413, 226, 230.**
**Kirghiz steppes,** region in s.e. Russia, **3084.**
**Kirk-Kilisseh** (*kērk-kē-lē-sā'*). Town 25 mi. n.e. of Adrianople; pop. 16,000; scene of first important Bulgarian victory over Turks in Balkan War of 1912.
**Kirk'stall Abbey,** at Leeds, England, **1985.**
**Kirk'wall,** cap. of Orkney Isls., important Brit. base during the World War; pop. 4000; fine Norman-Gothic cathedral begun in 1138; **2601.**
**Kirman,** Persia. Same as **Kerman.**
**Kiruna,** Sweden, mining town n. of Arctic Circle, **3403.**
**Kirunavara,** mt. in Sweden, **3403.**
**Kirunga,** volcano in Africa, **36.**
**Kishinef** (*kē-shē-nĕf'*) or **Chisanau,** Rumania. Town near Ukrainian border; pop. 114,000; agricultural center; scene of terrible pograms (1903, 1905).
**Kiska,** one of the westernmost Aleutian Isls., **2625.**
**Kissimmee River,** Florida, rises in lake of same name; flows s.e. 90 mi. to Lake Okechobee; *map,* **1298.**
**Kissingen** (*kĭs'ĭng-ĕn*), Germany, famous watering place in Bavaria, 60 mi. e. of Frankfort-on-Main; salt springs known from 9th cent.; **1357.**
**Kissinger, John R.,** Amer. soldier who risked his life in experiment to discover source of yellow fever, **2336, 754.**
**"Kitchen Cabinet,"** popular name applied to group of men who (although they held no important offices) influenced Pres. Jackson, **1857.**
**Kitch'ener of Khartum,** Horatio Herbert Kitchener, **Earl** (1850–1916), Brit. general, **1929–30.**

**Kitchener** (formerly Berlin), Ontario. Mfg. city 60 mi. s.w. of Toronto; pop. 22,000; furniture, rubber goods, machinery, clothing.
**Kite,** a bird of prey, **1930, 1607,** *picture,* **1606.**
**Kite balloons, 316, 320,** *pictures,* **317, 3792.**
**Kites, 1930–2;** airplane compared with, **55;** box, **1930, 1932,** *pictures,* **1930, 55;** in China, **742, 1931;** "glider," **55,** *picture,* **56;** highest ascent, *diagram,* **51;** how to make and fly, **1930, 1932;** used in Weather Bureau, **1930,** *picture,* **3709.**
**Kitool,** a wood fiber, **516.**
**Kittatin'ny** or **Blue Mts.,** range of the Appalachians; Delaware Water Gap, **989;** in N.J., **2457;** in Pa., **2718.**
**Kit'tiwake.** A gull of the Arctic regions named from its cry; hind toe entirely absent or rudimentary; it is 18 inches long and has white plumage with a pale bluish gray mantle.
**Kiushu,** Japan. Same as **Kyushu.**
**Kiyonaga** (18th cent.), Japanese color-print artist; picture by, **1875.**
**Kjerulf** (*kyā'rŭlf*), **Halfdan** (1815–68). Norwegian composer, famous for his songs, but his piano compositions are equally charming.
**Kjöbenhavn** (*kyē'bĕn-hävn*), Danish name of Copenhagen, **880.**
**Kjölen Mts.** Same as **Kiolen Mts.**
**Klagenfurt** (*klä'gĕn-furt*), important mfg. city of Lower Austria; pop. 27,000; chief city of Klagenfurt region (800 sq. mi.) which voted to remain in Austria after World War; plebiscite area, *map,* **308.**
**Klamath** (*klă'măt*) **Indians.** A tribe occupying Klamath Indian Reservation (1360 sq. mi.) in s. Oregon.
**Klamath River,** 180 mi. long, rising in Upper Klamath L. in s. Oregon and flowing through n. Calif. into Pacific. *maps,* **578, 2596.**
**"Klappdans,"** Swedish folk-dance, *picture,* **1318.**
**Klar River,** short stream in s. of Scandinavian peninsula; flows into Lake Wenner; *map,* **2531.**
**Klausenburg** (*klou'zĕn-bŭrĸ*), also **Kolozsvar** or **Cluj,** Rumania. City 200 mi. n.w. of Bucharest; pop. 61,000; scientific and literary center of Transylvania; univ.; varied mfrs.
**Kléber** (*klā-bĕr'*), **Jean Baptiste** (1753–1800). Fr. Rev. general, one of greatest of epoch; assassinated while subjugating Egypt.
**Kleist** (*klīst*), **Heinrich von** (1777–1811), Ger. romantic dramatist and poet; chief works, **1438.**
**Klon'dike,** a gold-mining dist. in Yukon Territory, Canada, **1933, 3835–6;** route of gold-seekers, *picture-map,* **75.**
**Klopstock** (*klŏp'shtŏk*), **Friedrich Gottlieb** (1724–1803), Ger. epic, lyric, and dramatic poet; helped free Ger. literature from foreign, especially French, influence; **1436, 1438.**
**Kluck** (*klŭk*), **Alexander von** (born 1846), Prussian general and field marshal, **2150.**
**Klutchevska'ya** or **Kluchef,** volcano of e. Siberia. **1907.**
**Kneller** (*nĕl'ĕr*), **Sir Godfrey** (1648–1723). Court painter to Charles II and succeeding Eng. sovereigns to George I; b. Germany.
**Knick'erbocker, Diedrich.** Pretended author of Washington Irving's burlesque history of New York City. The Knickerbockers were an old Dutch family, and the name is now commonly applied to descendants of the original Dutch settlers of N.Y.
**'Knickerbocker's History of New York',** by Washington Irving, **1831.**
**Knighthood and chivalry, 1933–5, 753–4;** armor, **214–6;** King Arthur and his Round Table, **223–4, 3068–70;** castle, **654–7;** Froissart's chronicles, **1375;** heraldry, **1639;** orders of knighthood, **979, 932, 1935;** romances, **3039;** romances burlesqued by Cervantes, **683–4;** story, 'The Tournament of Ashby', **3152–3.**
**Knights Hospitalers of St. John, 932, 2131, 3011.**
**Knights of Columbus,** Rom. Cath. fraternal organization, **1935.**
**Knights of Labor** (U.S.), **1947, 2871.**
**Knights of Malta, 2131.**
**Knights of Pythias,** fraternal society, **957.**
**Knights of the Golden Circle, 781.**
**Knights of the Round Table, 3068–70, 1391;** growth of legends, **223.**
**'Knight's Tale of Palamon and Arcite',** retold from Chaucer's 'Canterbury Tales, **704, 706.**
**Knights Templars** (crusading order), **932;** Temple in London, **2053.**
**Knitted goods, 1935, 1937, 804.**
**Knitting machines, 1935–7;** Jacquard attachment, **3327.**
**Knives and forks, 1937;** of Stone Age, *picture,* **3361.** *See also in Index* **Cutlery.**
**Knobstone Escarpment,** in Indiana, **1757.**
**Knossus.** Same as **Cnossus.**
**Knot,** a sandpiper, **3261.**
**Knot,** nautical unit for measuring a ship's speed, **2045;** used as equivalent of nautical mile (1.15 statute mi.), **3715.**
**Knotgrass.** A common trailing weed of the buckwheat family (*Polygonaceae*) with jointed stems, long grasslike leaves, and small greenish flowers.
**Knots, hitches, and splices, 1937–41;** weavers', **3078.**
**Knowles, Lucius James** (1819–84), Amer. inventor; devised a safety steam-boiler feed-regulator, several models of steam engines, and many loom improvements; **3787.**
**Know Nothing party** (U.S.), **1240, 2871.**
**"Know then thyself, presume not God to scan," 2879.**
**"Know thyself," 3270.**
**Knox, Henry** (1750–1806). Amer. Rev. general, b. Boston, one of Washington's trusted advisers and his sec. of war (1785–94).
**Knox, John** (1505?–72), Scotch Protestant leader, **1941;** Edinburgh associations, **1080;** influence on Puritan movement, **2937.**
**Knox, Philander Chase** (1853–1921). Amer. lawyer and statesman, b. Brownsville, Pa.; U.S. atty.-gen. 1901–04 under McKinley and Roosevelt; sec. of state 1909–13 under Taft; senator from Pa. after 1913.
**Knox College.** At Galesburg, Ill.; co-ed.; founded 1837; arts and sciences.
**Knoxville,** Tenn., in e. on Tennessee R., mfg. city and distributing point for mineral and agricultural region; pop. 77,818; scene of desperate fighting during Civil War; **3465;** state univ., Science Building, *picture,* **3467.**
**Koala** (*kō-ä'lȧ*), a tree-dwelling Australian marsupial about 2 ft. long, **1908.**
**Koksoak River,** Quebec, largest river in Labrador peninsula; flows n. 500 mi. to Ungava Bay; many tributaries; *map,* **602–3.**
**Kobe** (*kō'bā*) or **Hiogo-Kobe,** Japan, important seaport in s. of isl. of Honshu; pop. 610,000; great shipyard; port of Osaka, **1864, 2602.**
**Ko'bold** or **gnome,** in Ger. folklore, a teasing, michievous elf, **816, 1219.**
**Koch** (*kōĸ*), **John Peter** (born 1870), Danish Arctic explorer; 1912–13 led expedition over inland ice of Greenland; route, *map,* **1540.**
**Koch, Robert** (1843–1910), Ger. physician and bacteriologist; studied tuberculosis, cholera, and tropical fevers; originated tuberculin treatment; 1905 Nobel prizewinner in medicine; discovers anthrax germ, **1450.**
**Kocher** (*kōĸ'ĕr*), **Emil Theodore** (1841–1917). Swiss surgeon, first to operate successfully for exophthalmic goiter; 1909 Nobel prizewinner in medicine.
**Kodiak** (*käd-yăk'*) or **Kadiak Island,** off coast of Alaska, s. of Cook Inlet; 36,000 sq. mi.; greatest salmon fisheries in Alaska; growing agricultural and grazing industries; *map,* **75.**
**Kodok.** *See in Index* **Fashoda.**
**Kohinoor** (*kō-ĭ-nōr'*), a famous diamond among Eng. crown jewels, **1004, 2050,** *pictures,* **1004, 1005, 1429.**
**Kohlrabi** (*kōl'rä-bĭ*), vegetable of the cabbage type, **553,** *picture,* **554;** when and how to plant, **1397.**
**Kokand.** Same as **Khokand.**
**Ko'komo,** Ind. Mfg. city on Wildcat R., 50 mi. n. of Indianapolis; pop. 30,067; glass, steel, and brass products, automobiles.
**Koko-Nor'** or **Kuku-Nor,** lake in cent. Asia, in n.e. Tibet, **226.**
**Kola Peninsula.** A mountainous peninsula of Russia between the Arctic Ocean and the White Sea; 50,000 sq. mi. Its n. coast, called the Murman Coast, has several ice-free ports. *See in Index* **Murman Coast.**
**Kolchak, Vladimir V., Admiral** (1875–1920). Former imperial Rus. naval officer; headed Omsk govt. (Nov. 1917–Jan. 1920), recognized by Supreme Council as *de facto* Rus. govt.; organized Siberian anti-Bolshevik army and held country nearly to Volga before 1919 summer campaign of Red Army forced retreat and collapse of his govt.; executed by Irkutsk revolutionary commission.
**Kolin** (*kō-lēn'*), Czecho-Slovakia. Town on Elbe R., 30 mi. e. of Prague; pop. 16,000; Austrians defeated Frederick II of Prussia (1757), securing evacuation of Bohemia.
**Kolin'sky fur, 1390.**
**Köln** (*kŭln*). Ger. name of **Cologne.**
**Kol'okol, Czar,** the great bell in the Moscow Kremlin, **379,** *pictures,* **379, 2332.**
**Kolozsvar** (*kŏ-lŏzh-vär'*). Same as **Klausenburg.**
**Koltsof** (*kōl-tsōf'*), **Alexis Vasilevitch** (1808–42), Rus. lyric poet, called the "Russian Burns," **3098,** *picture,* **3097.**
**Komorn** (*kō'môrn*) or **Komarom** (*kō'mä-rōm*), Czecho-Slovakia. Town on Danube R., 50 mi. s.e. of Pressburg; pop. 22,000; surrendered to Austrians (1849) after brilliant defense in Hungarian rev.; grain and timber trade.
**Komura** (*kō'mu-rä*), **Jutaro, Marquis** (1855–1911). Japanese statesman and diplomat, minister to Russia and to U.S.; plenipotentiary (1905) at Portsmouth Peace conference.
**Kongo.** Same as **Congo.**
**Ko'nia** or **Konieh,** Asia Minor. City on Bagdad R.R., 280 mi. s.e. of Constantinople; pop. 45,000; anc. Iconium; became Seljuk cap. 1097; taken by Frederick Barbarossa 1190; annexed to Turkey in 15th cent.; famous medieval orchards; carpets, textiles.
**Königgrätz** (*kū'nĭĸ-grĕts*), Czecho-Slovakia. Small city 65 mi. e. of Prague; 13th cent. cathedral; varied mfrs.; battle of Sadowa or Königgrätz (1866) in Austro-Prussian War fought near by; **1448.**

**Königsberg** (*kû'nĭĸs-bĕrĸ*), Germany, fortified seaport, cap. of e. Prussia, on Pregel R., 4 mi. from mouth; pop. 261,000; varied mfrs.; large univ.; bombarded by Russians in 1914; **1440.**

**Konti, Isidore** (born 1862), Amer. sculptor, b. Vienna; monumental decorative work for Chicago World's Fair and other expositions; statue by, *picture*, **109.**

**Koo'doo.** One of the largest of African antelopes, having a white stripe down the back and 8 or 10 vertical stripes descending from it down the sides; male has long horns twisted into an open spiral.

**Kootenay** (*kọ'tĕ-nā*) **district, 512.**

**Kootenay River,** tributary of Columbia R.; 400 mi. long; rises in Canadian Rockics, flows s. into Mont. and Idaho and back into Brit. Columbia through wild picturesque region; course, **512.**

**Koran',** sacred book of Mohammedans, **1942, 2276.**

**Kordofan** (*kôr-dō-fän'*). A province in Anglo-Egyptian Sudan, Africa; about 130,000 sq. mi.; cap. El Obeid; fine gum forests.

**Kore'a** or **Chosen,** peninsula of e. Asia between the Sea of Japan and the Yellow Sea; 84,738 sq. mi.; pop. 17,500,000; a province of Japanese Empire; cap. Seoul; **1942–4,** *maps*, **232–3, 1864;** ginseng, **1460;** kite-flying, **1931.**

**Korea, Strait of.** Separates Korea from rest of Japan and unites Sea of Japan with Eastern Sea; Rus. naval power destroyed here by Japanese in 1905.

**Korna,** town in Mesopotamia, **1187.**

**Körner** (*kûr'nĕr*), **Karl Theodor** (1791–1813). Ger. poet and patriot; roused his countrymen by his patriotic songs; died fighting against Napoleon.

**Kornilov, Laurus Georgievich** (1870–1918). Rus. general, commanded in Galician campaign during World War; his abortive mutiny against Kerensky (1917) prepared way for later Bolshevik victory; killed in battle against Red Army while leading Volunteer Army in "ice flight" in the Kuban.

**Kosciusko** or **Kosciuszko** (*kŏs-i-ŭs'kō*), **Thaddeus** (1746–1817), Polish general and patriot, **1944, 2238, 914.**

**Kosciusko, Mt.,** in Australian Alps, N.S. Wales, (7336 ft.), **261.**

**Kosher** (*kō'shẽr*), Jewish term for food made ceremonially clean; especially applied to meat slaughtered in a way insuring complete bleeding of the body; **1891.**

**Koshtantau** (*kŏsh-tän-tou'*), **Mt., in** Caucasus range, **663.**

**Kosice.** Same as **Kassa.**

**Kossovo** (*kŏ-sō'vō*), plain in s.w. Jugo-Slavia, near Prisrend; battle (1389), **3177, 3559.**

**Kos'suth, Louis** (1802–94), Hungarian patriot, **1944–5, 1703.**

**Koto** (*kō'tō*). A Jap. harp consisting of a long box over which are stretched 13 strings, each with a bridge; played with both hands and tuned by shifting the bridges.

**Kotzebue** (*kŏt'sĕ-bŭ*), **August Friedrich von** (1761–1819). Ger. playwright, extraordinarily prolific and popular all over Europe; best-known play translated as 'The Stranger'.

**Koumis.** Same as **Kumiss.**

**Kovno** (*kŏv'nō*). Trade center in cent. Lithuania, on Niemen R.; pop. 90,000, half Jewish; former Rus. fortress; wire, nails.

**Koweit** (*kō-wā-ēt'*) or **Kuweit,** port in n.e. Arabia on Persian Gulf; large transit trade; **167.**

**Kowloon',** small peninsula of China opposite isl. of Hongkong, **1679.**

**Kraals** (*krälz*), native villages in Africa, *pictures*, **37, 38, 3280.**

**Krafft** (*kräft*) or **Kraft, Adam** (about 1455–1507), principal Ger. sculptor of late Gothic period; his masterpiece, pyramid 64 ft. high, remarkable for its rich and delicate decorations in figures and relief and its architectural beauty; works in Nuremberg, **2543.**

**Kraft paper, 2673.**

**Krag-Jorgensen,** a rifle, **1254.**

**Krait** (*krāt*), venomous bluish snake of India, **3259, 1748.**

**Krajova.** Same as **Craiovo.**

**Krakatoa** (*krä-kà-tō'à*), small volcanic isl. in E. Indies between Java and Sumatra; eruption of 1883, **3658.**

**Kra'ken,** Norwegian name for seaserpent, **3169.**

**Krakow.** Same as **Cracow.**

**Kranach** (*krä'näĸ*), **Lucas.** Same as **Cranach.**

**Krasnoyarsk** (*kräs-nō-yärsk'*), Siberia. City on Yenisei R. and Trans-Siberian R.R.; pop. 88,000; center of gold washings of Yeniseisk dist.

**Krefeld** (*krā'fĕlt*) or **Crefeld,** Germany, mfg. town in Prussia, 30 mi. n.w. of Cologne; pop. 125,000; famous technical school; mfrs., **1443.**

**Kreisler** (*krī'zlẽr*), **Fritz** (born 1875). Austrian violinist and composer, generally conceded to be the greatest of living violinists; in Austrian army 1914, wounded at Lemberg ('Caprice Viennois').

**Krem'lin,** citadel of Moscow, **2332,** *pictures*, **2332, 3093, 3095;** Czar Kolokol bell, **379.**

**Kreutzer** (*kroit'zẽr*), **Rudolph** (1766–1831). Fr. violinist of Ger. extraction; friend of Beethoven, who dedicated to him his "Kreutzer Sonata'.

**Kreuzotter,** an adder, **3647.**

**Kriemhild** (*krēm'hĭlt*), in the Nibelungenlied, wife of the hero Siegfried, **3231, 2504.**

**Kriemhilde Line** (in World War), rearmost Ger. defensive position in Meuse-Argonne region, **194.**

**Kris,** Malay sword, **3423,** *picture*, **3422.**

**Krish'na,** a Hindu god, **1651.**

**Kris Kringle** or **Christ Child,** name a corruption of Ger. *Christ Kindlein*, "the little Christ Child"; supposed to bring gifts, **759.**

**Kronborg Castle,** Elsinore, **880.**

**Kronos** or **Cronos,** in Gk. myth., Titan ruler of universe, **3607, 3129, 1382.**

**Kronstadt** (*krōn'stät*) or **Brasso** (*brä-shō'*), Rumania. City 85 mi. n.w. of Bucharest; pop. 42,000; commanded by Schlossberg citadel; "Black Church" (14th cent.); metal and wood mfrs.

**Kronstadt,** Russia. Port and fortified city on isl. of Kotlin in Gulf of Finland 31 mi. w. of Petrograd; pop. 68,000; founded 1710 by Peter the Great.

**Kropot'kin, Peter, Prince** (1842–1921), Rus. geographer and anarchist; first to show that structural lines of physical Asia run s.w.–n.e.; exiled and imprisoned for advocating peaceful anarchy; anarchistic doctrine, **3269.**

**Krüger** (*krü'gẽr*), **Paul** (1825–1904), Boer patriot, known as "Oom Paul" (Uncle Paul); pres. of S. African Republic (Transvaal) 1883–1901; **3527, 3282, 447.**

**Krupp** (*krụp*), **Alfred** (1812–87). Ger. "cannon king," discoverer of method of casting steel in large pieces; made great guns used (1870–71) in the siege of Paris.

**Krupp, Friedrich** (1787–1826), Ger. iron-master founder of house of Krupp and of great Krupp works at Essen; introduced manufacture of cast steel into Germany; died in poverty; **1178.**

**Krupp, Friedrich Alfred** (1854–1902). Son of Alfred and grandson of Friedrich; richest man in Germany; handed on the Krupp business to his daughter Bertha.

**Krupp von Bohlen und Halbach, Bertha** (born 1886). Eldest daughter of Friedrich Alfred; brought up to manage Krupp works, which she inherited at age of 16; married 1906 Baron von Bohlen und Halbach, who was then made chief director of Krupp works; known as richest woman in Europe.

**Krupp Steel Works, 1178, 1443,** *picture*, **1444.**

**Kryp'ton,** a rare gaseous element, **4042;** contained in air, **50.**

**Kshatriyas** (*kshŭt'rĭ-yà*), a Hindu caste, **1651, 1750.**

**Kuban' River,** 500 mi. long, flows across w. half of n. Caucasia and receives many affluents from Caucasus Mts.; outlet, **434;** source, *picture*, **3091.**

**Kubelik** (*kụ'bĕ-lĭk*), **Jan** (born 1880). Bohemian violinist; acquired extraordinary technique at early age and for a decade was the most popular concert virtuoso.

**Kublai Khan** (*kụ'blī kän*) (1216–94), one of greatest, most intelligent, and most cultured of Mongol rulers, grandson of Genghis Khan; completed conquest of China; **2285, 2874.**

**Kuenlun** (*kwĕn-lụn'*) **Mts.,** in cent. Asia on n. border of Tibet; highest peak estimated 25,000 ft.; **226, 3827,** *map*, **740.**

**Kufra,** group of 5 oases in Sahara n. of Tropic of Cancer; 7000 sq. mi.; pop. 6000 nomads; town of Kufra on caravan route; **3104, 3105.**

**Kühlmann, Richard von** (born 1873). Ger. diplomat; sec. of state for Foreign Affairs 1917–18, negotiating treaties with Russia and Rumania; opposition of higher command of army and the Chancellor Count Hertling, caused him to resign.

**Kuka** (*kọ'kä*), town in n.e. corner of Nigeria, Africa; pop. 50,000; slave-mart previous to 1894; **3105.**

**Kuku-Nor.** Same as **Koko-Nor.**

**Ku Klux** (*kū klŭks*) **Klan,** secret society in South, which at close of Amer. Civil War sought to frighten negroes into obedience and to counteract influence of "carpet-baggers," **781.**

**Kulm** (*kụlm*), Czecho-Slovakia. Village in Bohemia, where the French defeated allied Russian, Austrian, and Prussian troops 1813.

**Ku'miss,** a drink made from milk, **2239.**

**Kum'quat,** a plum-shaped citrus fruit, **2590;** crossed with lime, **2011.**

**Kun, Bela** (born 1886), Hungarian Communist leader; while prisoner of war in Russia instructed by Lenine, and after collapse of Central Powers sent back to Hungary 1918 to found Soviet Republic; after its fall, escaped 1920 to Russia where he was employed by Soviet; in Budapest, **524.**

**Kunersdorf** (*kụ'nẽrz-dôrf*). Village in Prussia, 4 mi. n.e. of Frankfort-on-the-Oder; Prussians defeated by Russians and Austrians 1759 (Seven Years' War).

**Kur,** principal r. of Transcaucasia, flowing s.w. 820 mi.; navigable for 350 mi. from mouth; outlet, **654.**

**Kurdistan',** 1945; Tigris r., **3499.**

**Kurds,** Mohammedan tribes of Asia Minor, **1945, 213, 2734, 2735;** rug-

making, **3078**; women's costume, *picture*, **3079**.

**Kuré** (*kụ'rā*), Japan. Important naval port on Honshu Isl. and Inland Sea; pop. 155,000; armament factory.

**Kuria Muria** (*kụ'rĭ-ä mụ'rē-ä*) **Islands.** Group of 5 isls. off s. coast of Arabia; 28 sq. mi.; part of Brit. colony of Aden; cable station.

**Kuril** (*kụ'rĭl*) or **Chishima Islands,** group of volcanic isls. stretching n.e. from Hokushu Isl., Japan; 6068 sq. mi.; name comes from Rus. *kurit* ("to smoke") in allusion to active volcanoes; **1863**, *map*, **1864**; seal herds, **3167**.

**Kuroki** (*kụ-rō'kē*), **Itei, Count** (born 1844). Japanese general and samurai; distinguished in Chino-Japanese War of 1894–95; in Russo-Japanese War of 1904–05 commanded First Army, defeated Russians at Yalu R., and assisted Oyama at Mukden.

**Kuropatkin** (*kụ-rō-pät'kĭn*), **Alexei Nikolaievich** (1848–1921), Rus. general; in supreme command in East during Russo-Japanese War, until after battle of Mukden; again commanded an army 1916 in World War; retired to private life 1917; **3098**.

**Kuro Siwo** (Jap. "black tide"). Same as **Japanese current.**

**Kus'kokwim River,** one of chief rivers of Alaska; 550 mi. to Bering Sea; *map*, **75**.

**Kustendje** (*kụ-stĕn'jā*). Same as **Constantza.**

**Kutb Minar,** tower at Delhi, **991**, *picture*, **989**.

**Kut-el-Amara** (*kụt-ĕl-ȧ-mä'rȧ*), Mesopotamia, town on Tigris R., 105 mi. s.e. of Bagdad; r.r. terminus; coaling point; strategic point in World War; Brit. force under Townshend surrendered to Turks after severe siege, **3795**.

**Kutenai** (*kụ'tĕ-nā*) or **Kootenay,** tribe of N. Amer. Indians; ranged through n. Mont. and s. Brit. Columbia; **1767**.

**Kuweit,** Arabia. Same as **Koweit.**

**Kvalö** or **Whale Island,** Norway, *picture*, **2536**.

**Kwang'chow Wan** or **Kwang'chow Bay.** Coaling station on s. coast of China between Hongkong and the Island of Hainau leased to France; 190 sq. mi.; pop. 168,000.

**Kwangsi** (*kwäng'sē*). Inland province of s. China; 77,200 sq. mi.; pop. 5,500,000; cap. Nanning (Kweilin); commercial center Wuchow; cassia, grain, metals, gems.

**Kwang-Su** or **Kuang-Hsu.** The reign title of Tsai T'ien (1872–1908), emperor of China; during his reign occurred the war with Japan, the Boxer uprising, and the occupation of Peking by the United Powers; under domination of the Empress Dowager, Tsze-Hsi.

**Kwang'tung** or **Kwantung.** Province of s.e. China; 75,000 sq. mi.; pop. estimated 30,000,000; considerable mineral wealth (gold, coal, iron); large exports of silk; chief cities Hongkong, Macao, Canton.

**Kwan-tung Peninsula,** most s. portion of Manchuria; in province of Shenking; Port Arthur, **2135**.

**Kweichow** (*kwī'chou*). Province of s.w. China; 67,160 sq. mi.; pop. 9,300,000; cap. Kweiyang; gold, silver, mercury, tin, coal, and iron.

**Kyd** (*kĭd*), **Thomas** (1558?–94). Eng. dramatist, one of most important predecessors of Shakespeare ('The Spanish Tragedy').

**Kyo'to** or **Kioto,** former cap. of Japan; pop. 540,000; **1945–6**, **1864**; art museum, **1874**.

**Kyrie Eleison** (*kĭr'ĭ-ă ē-lā'ĭ-sŏn*). Gk. words, meaning "Lord have mercy," used as form of prayer in both Gk. and Rom. Cath. churches, and also (translated) in Anglican church.

**Kyushu** or **Kiushu** (*kū-shụ'*), southernmost of 4 large isls. forming Japan proper; 13,870 sq. mi.; mountainous and volcanic; *map*, **1864**; coal, **1867**.

# L

THE letter L is thought to be descended from  the ancient Egyptian hieroglyph representing a lioness  which became the symbol  or  when written in a running hand. Here we can already see some resemblance to our letter. The Phoenicians wrote it like this  and called it *Lamed*, "ox-goad," from its resemblance to that object. The Greeks called it *Lambda* and turned it about so that it looked like our V upside down Λ The Romans straightened it out to the form we have today. The letters L and R, known as the liquids, are very closely related. In fact scholars tell us that in Egyptian, as in some other languages, no clear distinction was made between them, the signs for these letters being used interchangeably. There are peoples, the Chinese for example, who cannot sound the *r*, and these substitute *l* for *r*, as when they say *Melican* for *American*. This use of *l* for *r* is known as "lambdacism." The Japanese, on the other hand, substitute *r* for *l*.


**Laaland** (*lą'länd*), Danish isl. in Baltic Sea; 445 sq. mi.; **996,** *map,* **997.**

**La'ban.** Father-in-law of Jacob who served him 7 years for his daughter Rachel (Gen. xxviii–xxxi).

**Labiatae** (*lā-bī-ā'tē*) or **Menthaceae,** plant family including mint, catnip, and ground-ivy, **2258.**

**Labiche** (*lä-bēsh'*), **Eugène M.** (1815–88). Fr. dramatist ('Le Voyage de M. Perrichon').

**'La Bohème'** (*lä bō-ĕm'*), opera, **2584.**

**Labor,** as an economic factor, **1077;** arbitration of disputes, **172–3, 1487, 269, 2500;** in Argentina, **192;** boycott, **476;** and capital, Marxian doctrine, **3268;** child labor, **728–9;** division of, **1076;** factory system, **1218, 1778, 806, 3221;** in Italy, **1840;** in Japan, **1867;** slavery and serfdom, **3248–50;** in Spain, **330;** sweatshop system, **3400, 805–6.** *See also in Index* **Strikes.**

**Labor, Department of,** U.S., **3597, 3600;** established, **3060, 3428.**

**Labor, division of, 1076.**

**Labor Day,** in U. S., legal holiday in all states, Dist. of Columbia, Porto Rico, Hawaii, and Alaska; inaugurated by Knights of Labor 1882; **1673.**

**Labor legislation, 1218;** Adamson law, **3747;** child labor laws, **728–9;** compulsory arbitration, **269, 2500;** employers' liability, **1145;** in Germany, **1443, 1449;** Gompers' influence, **1487.**

**Labor organizations, 1947;** Gompers' work, **1487;** Greenback-Labor party, **1611;** Knights of Labor, **2871;** medieval gilds, **1459–60;** negroes in, **2434;** and socialism, **3268.**

**Labor party** (England), formed 1906 to represent organized labor and Socialists; at first coöperated with Liberals, later adopted socialistic program of reform; **2869.**

**Labouchère** (*lă-bo̧-shêr'*), **Henry Dupré** (1831–1912). Eng. journalist and radical politician, editor of the weekly *Truth*, noted for exposure of public frauds.

**Lab'rador,** most easterly part of Brit. N. Amer., a dependency of Newfoundland; 120,000 sq. mi.; pop. 4000; **1948,** *maps,* **602–3, 616;** discovered, **562;** Eskimos, **1174–7;** work of Dr. Grenfell, **1541–2.**

**Labrador current, 255, 1948, 1549;** causes fogs, **1316.**

**La Bruyère** (*lä brü-yêr'*), **Jean de** (1645–96), Fr. essayist, one of best writers of classical French; chief works, **1365.**

**Labuan** (*lä-bu̧-än'*). Brit. isl. of Malay Archipelago, 6 mi. n.w. of Borneo, incorporated with Singapore; 29 sq. mi.; pop. 7000; cap. Victoria.

**Labur'num.** A small tree native to s. Europe; cultivated for showy yellow flowers and glossy foliage; all parts poisonous; in U.S. often called bean tree.

**Lab'yrinth,** name given by Greeks and Romans to buildings, entirely or partly underground, with intricate winding passages in which one easily became lost; at Crete, **918;** in Gk. myth., **949, 3487.**

**Labyrinths,** structures of inner ear, **1057.**

**Lac** (*lăk*), resinous substance, consisting of shellac and crimson coloring matter, secreted by scale insects, **1954, 3133.**

**Laccadive** (*lăk'ă-dīv*) **Islands.** Brit. group of 14 coral isls. 200 mi. w. of s. India in Indian Ocean; pop. 11,000.

**Lace, 1949–53;** mfrs. in Belgium, **374;** gold, **1482;** Jacquard loom, **3327,** *pictures,* **1951–3;** linen thread for, **2018;** varieties, **1950.**

**Lacedaemon** (*lăs-ĕ-dē'mo̧n*). Same as **Sparta.**

**Lace-making machinery,** *pictures,* **1951–3.**

**Lacertil'ia,** the lizard order of reptiles, **2038.**

**Lacewing fly, 1789–90, 1791;** eggs, *picture,* **1091.**

**Lachesis** (*lăk'ĕ-sĭs*), one of the Fates, **1225.**

**Lachine** (*lă-shēn'*), Quebec. Residential town and resort on L. St. Louis connected with Montreal, 8 mi. n.e., by Lachine Canal; pop. 16,000; large water commerce and various mfrs.; burned by Indians and inhabitants massacred in 1689.

**Lachine Rapids,** in St. Lawrence R., **3108;** effect on commerce of Montreal, **2317.**

**Lachish** (*lā'kĭsh*). Anc. city in s. Palestine, often mentioned in Tel-el-Amarna tablets and in Bible: destroyed by Joshua (Joshua x, 31–3) and assigned to tribe of Judah (xv, 39).

**Lac-insect,** scale insect which secretes the resinous substance lac, **3133, 1954.**

**Lackawan'na,** N.Y. Industrial and r.r. city on Lackawanna R. 6 mi. from Buffalo; pop. 17,918; large steel plant.

**Lackawanna River,** in n.e. Pa.; flows 60 mi. s.w. to Susquehanna R.; at Scranton, **3153.**

**Lackland,** nickname for King John of England, **1896.**

**Laconia** (*lă-kō'nĭ-ȧ*), in anc. Greece, s.e. dist. of Peloponnesus, **1520, 3309,** *map,* **1518.**

**Laconia,** N.H. Summer resort and industrial city on Winnipesaukee R. 28 mi. n. of Concord in beautiful lake region; pop. 10,897; knit goods, r.r. cars, needles.

**Lacquer** (*lăk'ẽr*), resinous varnish obtained from Japanese varnish-tree, **1954;** tree belongs to sumachs, **3391.**

**Lacquer-ware, 1954;** Japanese, **1876.**

**La Crosse** (*lȧ-krôs'*), Wis., mfg. and trade center on Mississippi R. 120 mi. s.e. of St. Paul, Minn.; pop. 30,421; center of stock-raising and dairying region and tobacco market; boots and shoes, lumber products, agricultural machinery, flour; **3772.**

**Lacrosse,** a game, **1954–5;** early form of, *picture,* **1772.**

**Lac** (*lăk*) **sulphuris,** milk of sulphur, **3390.**

**Lacta'rius, parchment,** a mushroom, color plate, **2374–5.**

**Lac'tic acid,** a bitter acid in sour milk; in buttermilk, **2239;** caused by fermentation, **1232.**

**Lac'tose,** or milk sugar, **2239, 3388.**

**Lacus'trine plain,** the bottom of a dried-up lake, **2790.**

**Ladd, George Trumbull** (1842–1921). Amer. philosopher, b. Painesville, Ohio; one of first to introduce study of experimental psychology into America; founded Yale psychological laboratory (translation, Lötze's 'Outlines of Philosophy', 6 vols.).

**Ladies' sorrel** or **wood sorrel,** an oxalis with small white flowers, **2607;** acid leaves, **2417;** ejects seeds forcibly, **3712.**

**Ladislaus** (*lăd'ĭs-lą̄s*) **I, Saint** (1040–95). King of Hungary and founder of national greatness; established Christianity and subdued heathen hordes; most beloved of Hungarian kings.

**Ladoga** (*lä'dō-gä*), **Lake,** largest lake of Europe, in n.w. Russia; 7000 sq. mi.; **1955.**

**Ladrone** (*lă-drōn'*) or **Mariana Islands,** in the Pacific, about 1500 mi. e. of the Philippines; 440 sq. mi.; formerly part of Ger. New Guinea, now administered by Japan (except Guam, ceded to U.S. 1898); **1545, 2620,** *map,* **2624–5.**

**Ladybird** or **ladybug,** a small spotted beetle, **1955, 371;** preys upon aphids, **154,** scale insects, **3132–3.**

**Lady of the Lake.** In Arthurian legend, water fairy who reared Lancelot.

**'Lady of the Lake, The',** poem by Scott, **3151.**

**Ladysmith,** South Africa, trade center and r.r. junction in n. Natal; pop. 6000; besieged by Bocrs for 118 days (1899–1900) during S. African War; Roberts raises siege, **3027.**

**Lady's slipper,** a plant of the orchid type, **1955, 2593;** poisonous type, **2852;** structure of ovary, *picture,* **1311.**

**Laertes** (*lā-ēr'tēz*), father of Odysseus, **2564.**

**Laertes,** in Shakespeare's 'Hamlet', **1570.**

**Laevo-ro'tatory light,** polarized light turned to the left, **3438, 2000.**

**La Farge** (*lä färj*), **John** (1835–1910), Amer. painter, mural decorator, and designer of first stained glass made in U.S.; b. New York; exercised great influence on Amer. art (lunettes, Supreme Court room, Minnesota State Capitol; 'Battle Window', Memorial Hall, Harvard); **2634, 471.**

**Lafayette** (*lä-fā-ĕt'*), **Gilbert du Motier, Marquis de** (1757–1834), Fr. general and patriot, **1956–7, 534, 987, 3004;** Pershing visits tomb, **3803;** statue, *picture,* **1956.**

**Lafayette, Marie-Madeleine, Comtesse de** (1634–92). Fr. novelist; her masterpiece, 'La Princesse de Cleves', is the first modern novel of sentiment in which the story's interest depends not on the incident but on the character of the persons involved.

**Lafayette,** Ind., city in agricultural region 60 mi. n.w. of Indianapolis; pop. 22,486; r.r. shops; makes iron products, wagons, carpets; Purdue Univ.; **1762.**

**"Lafayette, we are here," 3803.**

**Lafayette College.** Presb. institution for men at Easton, Pa.; opened 1832 (chartered 1826); classical, scientific, and engineering courses.

**Lafayette National Park,** Me., **2128, 2400.**

**Lafayette Square,** Washington, D.C., **3683, 1944;** statue of Lafayette, *picture,* **1956.**

**La Fère** (*lä fêr*), Fr. town on Oise R. 15 mi. n.w. of Laon; in World War, **3806.**

**Lafitte** (*lä-fēt'*), **Jean** (1780–1826?), Amer. pirate, slave-trader, and smuggler, b. France: pardoned 1815 by Pres. Madison for aid against British in battle of New Orleans; **1549.**

**La Follette** (*lä fŏl'ĕt*), **Robert Marion** (born 1855), Amer. political leader, b. Primrose, Wis.; gov. of Wis. 1900–05; U.S. senator since; a progressive Republican who always subordinated party ties to his own principles; strongly opposed U.S. entrance into World War; many of the reforms he sought incorporated in the "Wisconsin idea," **3771.**

**La Fontaine** (*lä fôn-tān'*), **Jean de** (1621–95), Fr. poet and fabulist ('Fables', old tales retold with sparkling freshness; memorized by every Fr. school child); **699, 1365.**

**La Fontaine, Sir Louis Hippolyte** (1807–64), Canadian jurist and statesman, premier 1842–44 and 1848–51; chief justice of Lower Canada 1853–64; and Baldwin, **307.**

**Lagash',** anc. city-kingdom in Babylonia, one of oldest centers of Sumerian civilization, **1053.**

**Lagerlöf** (*lä'gĕr-lûf*), **Ottilia Lovisa Selma** (born 1858), Swedish writer, **1957;** literary influence, **3134.**

**Lagoon',** a pool or lake, especially when connected with the sea; in coral isls., **2621.**

**Lagoon Islands.** Same as **Ellice Islands.**

**Lagos** (*lä'gōs.*) A region (formerly province) of S. Nigeria; in W. Africa; 27,000 sq. mi.; pop. 1,750,000; low marshy coast, with countless lagoons; forested interior yields palm oil and kernels, mahogany, rubber; chief cities Ibidan (150,000), Abbeokuta (60,000), Lagos, cap. (60,000).

**Lagos.** A seaport on s. coast of Portugal; victory of Brit. admiral Jervis (Earl St. Vincent) over Span. squadron 1797; Henry the Navigator founded town of Sagres here 1421.

**Lagrange** (*lä-grănzh'*), **Joseph Louis** (1736–1813). Fr. mathematician, one of greatest of 18th cent.; contributed to verification of Newtonian theory.

**Lagrange** (*lä-grānj'*), Ga. Industrial city and trade center, 63 mi. s.w. of Atlanta; pop. 17,038; cotton and cottonseed-oil mills, creamery.

**La Granja** (*lä grän'hä*), Spain. Same as **San Ildefonso.**

**La Guaira** (*lä gwī'rä*), Venezuela, on n. coast, seaport of Caracas; pop. 14,000; **3621;** street scene, *picture,* **3288.**

**Laguna de Madre** (*lä-gụ'nä dĕ mädrā'*), lagoon on Texas coast, **3474.**

**Lahn River,** Germany, joins Rhine after s.w. course of 135 mi., **3005.**

**La Hogue** (*lä hōg*) or **La Hougue, battle of,** fought 1692 near n.e. extremity of peninsula of Cotentin, Normandy, France; Eng. and Dutch fleets under Admiral Russell defeated Fr. fleet under Tourville; **1861.**

**Lahontan** (*lä-hôn'tăn*) **dam,** Nevada, *picture,* **1829.**

**Lahore** (*lä-hōr'*), Brit. India, anc. walled city on R. Ravi, largest city and cap. of Punjab; pop. 229,000; r.r. center; makes silk and cotton cloths, carpets, vegetable oils; Punjab Univ.; **1745.**

**Laibach** (*lī'bäĸ*), also **Ljubljana,** Jugo-Slavia. Slovenian city 50 mi. n. of Fiume; pop. 60,000; old castle on Schlossberg; cathedral; various mfrs.; Congress of Laibach 1821, at which emperors of Austria and Russia were present, restated the fundamental principles of the Holy Alliance.

**Laid paper, 2668.**

**L'Aiglon** (*lā-glôn'*), poetic name meaning "eaglet" given by Victor Hugo to Duke of Reichstadt, son of Napoleon and Marie Louise; Sarah Bernhardt in play by Rostand, *picture,* **1037.**

**Laissez-faire** (*lā-sā-fêr'*) ("let it be"). The 18th cent. (Fr.) way of saying "less government in business"; in contemporary use means unrestricted industrial and commercial competition.

**La'ity,** defined, **764.**

**La'ius,** in Gk. myth., father of Oedipus, **2566.**

**Lake, Simon** (born 1866), Amer. naval architect, b. Pleasantville, N.J.; inventor of even-keel type of submarine; **3378.**

**Lake Charles,** La., commercial and r.r. city on L. Charles, 182 mi. w. of New Orleans; pop. 13,088; yellow pine and oil near by; lumber and rice mills, ice plants, oil refinery; sulphur mines, **2070.**

**Lake Country** or **Lake District,** in n.w. England, containing all principal Eng. lakes, **1160,** *picture,* **1158;** home of Wordsworth, **3788,** of Coleridge, **825.**

**Lake-dwellers,** prehistoric inhabitants of Europe, **1957, 771–2,** *picture,* **773.**

**Lake-dwellings,** in Venezuela, **3621.**

**Lake Erie.** *See in Index* **Erie, Lake.**

**Lake Erie, battle of,** in War of 1812, **2730, 3672,** *picture,* **3671.**

**Lake Erie College.** At Painesville, Ohio; women; founded 1859 (continuing Willoughby Seminary, founded 1847), present title 1908; liberal arts.

**Lake Forest College.** At Lake Forest, Ill.; co-ed., Presb.; founded 1876; liberal arts and business administration.

**Lake herring,** a cisco, **3733.**

**Lake of the Woods,** an island-dotted body of water in extreme w. Ontario, bordering Minn.; 1500 sq. mi.; 70 mi. long; **3752,** *map,* **2254.**

**Lake Placid.** Village in N.Y.; pop. 2099; one of the most famous resorts in the Adirondacks; near by is the grave of John Brown, the abolitionist.

**Lake Poets,** a group of poets—Coleridge, Wordsworth, and Southey—who lived in the Lake Country of n. England, **825, 1160.**

**Lakes, 1957, 2791–2;** effect on climate, **1510;** Elephant Butte, largest artificial, **1139;** extinct, **1721, 1515, 3610;** glacial origin, **1721;** greatest depth, **305;** ox-bow, **1957, 2266;** salt, **2644, 1515;** volcanic origin, **3658.**

WORLD'S GREATEST LAKES

| NAME | AREA IN SQ. MI. |
|---|---|
| Caspian Sea | 169,330 |
| Superior | 31,200 |
| Victoria Nyanza | 26,000 |
| Aral Sea | 26,000 |
| Huron | 23,200 |
| Michigan | 22,400 |
| Nyasa | 14,200 |
| Tanganyika | 12,700 |
| Baikal | 11,580 |
| Erie | 10,000 |

**Lake trout, 3545.**

**Lakewood,** Ohio. Suburb of Cleveland 4 mi. w.; pop. 41,732; large carbon factory; also makes automobiles, machinery.

**Lakh** (*läk*), in Indian currency, **1752.**

**Laki, Mt.,** volcano in Iceland, **1723–4.**

**'Lalla Rookh'** (*lä'lä rọk*). Oriental romance by Thomas Moore; the heroine is an Indian princess to whom a young Persian poet recites tales in verse.

**'L'Allegro'** (*lăl-lā'grō*), poem by Milton; quoted, **1624.**

**La'maism,** national religion of Tibet, **3496.**

**Lamar', Lucius Quintus Cincinnatus** (1825–93). Amer. jurist and statesman, b. Putnam County, Ga.; drafted Mississippi ordinance of secession; U.S. senator 1877–85; sec. of interior 1885–88; justice U.S. Supreme Court 1888–93; helped reconciliation between North and South after Civil War.

**Lamarck** (*lä-märk'*), **Jean de** (1744–1829), Fr. naturalist, who suggested (in 1801) the word "biologie" as name of new science to be devoted to study of all life considered as the same process whether in plants or animals; forerunner of Darwin, **1208, 1210, 3841.**

**Lamartine** (*lä-mär-tēn'*), **Alphonse de** (1790–1869). Fr. poet, historian, and statesman ('Meditations'; 'History of the Girondins').

**Lamb, Charles** (1775–1834), Eng. essayist, **1957–8, 1178, 1167;** opinion of Coleridge, **826.**

**Lamb, Mary** (1764–1847), Eng. writer, sister of Charles Lamb, **1958.**

**Lamb,** a young sheep, **3198;** skin used for gloves, **1475;** wool, **3787.**

**Lamballe** (*läṅ-bäl'*), **Marie Thérèse de** (1749–92). Fr. princcss, friend of Marie Antoinette; killed by revolutionary mob and her head carried past the queen's prison windows.
**Lam'beth.** Metropolitan borough of s. London; pop. 303,000; Lambeth Palace, London residence of archbishop of Canterbury.
**Lamellibranchia'ta,** class of mollusks including clams and oysters, **3945.**
**Lamenta'tions.** Book of Old Testament traditionally ascribed to Jeremiah; comprises 5 dirges bewailing the destruction of Jerusalem.
**Lamia** (*lā'mĭ-à*). In Gk. myth., a beautiful vampire; in Keats' poem 'Lamia', a serpent who assumes a beautiful human form to win a man's love.
**Lämmergeyer** (*lêm'ĕr-gī-ĕr*), or bearded vulture, **3662.**
**La Motte Fouqué.** *See in Index* **Fouqué.**
**Lampblack,** a sooty form of carbon, **935, 688;** in ink, **1779;** in lead pencils, **2712;** in paint, **2642.**
**Lampman, Archibald** (1861–99), Canadian poet, **623–4.**
**Lamprey,** an eel-shaped cartilaginous fish with sucker mouth, **1958,** *pictures,* **1272, 2678;** ranked low among fishes, **1271;** parasitic upon fish, **2680.**
**Lamp'sacus.** Anc. Gk. city of Mysia, Asia Minor, on Hellespont, opposite Gallipoli.
**Lamps and lighting, 1958–9;** acetylene, **8;** electric, **1123–4, 1084;** Eskimo, **1175;** gas, **1406–8;** lighthouse, **2004;** lime or calcium light, **2010;** miner's safety lamp, **969.**
**Lamp shell,** or brachiopod, wormlike animal resembling a mollusk in appearance, **3201, 3814, 3945,** *picture,* **3203;** in Cambrian times, **1418;** evolutionary position, *diagram,* **128.**
**Lanai** (*lä-nä'ē*), one of the Hawaiian Isls.; 139 sq. mi.; highest point 3400 ft.; **1603,** *map,* **1604.**
**Lancashire** (*lăn'kà-shĕr*) or **Lancaster,** county of n.w. England; 1659 sq. mi.; pop. 4,960,000; iron and coal mines; mfrs. of textiles, machinery; **1959;** textile industry, **1158, 2134.**
**Lancaster** (*lăn'kăs-tĕr*), **John of Gaunt, Duke of.** *See in Index* **John of Gaunt.**
**Lancaster,** England, cap. of Lancashire, on Lune R., 7 mi. from sea; pop. 45,000; was anc. Rom. station; **1959.**
**Lancaster,** Ohio. Farming center and mfg. city on Hocking R., 28 mi. s. of Columbus; pop. 14,706; agricultural implements, stoves, paper, automobile tires, shoes, glass.
**Lancaster,** Pa., mfg. and r.r. center 34 mi. s.e. of Harrisburg; pop. 53,150; linoleum and cork goods, silks; has one of finest watch factories in world; Franklin and Marshall College; **2721.**
**Lancaster, House of,** famous Eng. royal family, **1959;** founded, **1634, 3016;** list of kings, **1152;** loses throne, **1635, 1088;** in Wars of the Roses, **3066, 3068.**
**Lance-corporal.** Soldier appointed to act as corporal but not given a warrant for the grade.
**Lancelet,** an aquatic, sand-burrowing animal, classed either as most primitive fish, or lower than fish, **1271, 3947;** evolutionary position, *diagram,* **128.**
**Lancelot** (*lăn'sĕ-lôt*) or **Launcelot of the Lake,** in Arthurian legend, the most famous and brave of the Knights of the Round Table; on quest for Grail, **1391;** wins the 9th diamond, story, **3069–70.**
**Land,** as a factor in economics, **1077;** Canadian public domain, **1960;** irrigation and reclamation, **1827–30;** proportion of earth's surface occupied by, **2554;** taxation, **3441, 3442, 2040;** U.S. public domain, **1959–60.** —*Tenure:* in Argentina, **191;** Australia, **269;** Chile, **738;** Egypt, **1096;** feudal system, **1235,** *picture,* **44;** France, **1347, 1353;** Hungary, **1702;** Ireland, **1807, 1808;** Italy, **1839, 1840;** Rome (anc.), **3044, 3046;** Russia, **3087, 3088;** Solon's reforms, **3274.**
**Land Banks, Federal** (U.S.), **328–9, 1224.**
**Landes** (*läṅd*), region of s.w. France, vast tract of sandy marshland bordered by dunes, **1346,** *picture,* **1347;** reclamation, **3122.**
**"Land flowing with milk and honey," 2645.**
**Land formations.** *See in Index* **Physiography.**
**Land grants,** for schools and colleges (U.S.), **1960, 830, 2529, 3142.**
**Lan'dis, Kenesaw Mountain** (born 1866). Amer. judge, b. Millville, Ohio; U.S. district judge northern district of Ill. 1905–22; tried Standard Oil rebate cases 1907 and sentenced defendants to pay $29,240,000; appointed national baseball arbiter 1920.
**Land League,** in Ireland. *See in Index* **Irish Land League.**
**Land measure,** units of, **3715.**
**Land Office, General,** U.S., **1960.**
**"Land of Morning Calm," 1942.**
**"Land of the Midnight Sun," 2529.**
**"Land of the Rising Sun," 1862.**
**"Land of the White Elephant," 3226.**
**Lan'dor, Walter Savage** (1775–1864). Eng. author; a poet of distinction as well as one of the greatest masters of Eng. prose style ('Pericles and Aspasia'; 'Imaginary Conversations').
**Lands, public, 1959–60, 2528;** conservation, **869–70, 3060, 3062;** grants for education, **1960, 830, 2529, 3142;** Harrison's policy, **1594;** irrigation and reclamation, **1827, 1829–30;** Johnson's Homestead Bill, **1896;** surveying methods, **3398, 1960.**
**Landscape painting:** Corot, **892–3;** development, **2630, 2631;** examples, *pictures,* **2637;** Millet, **2239–40;** Turner, **3561.**
**Land'seer, Sir Edwin** (1802–73), Eng. painter of animals, **1960–1;** sculptured lions on Nelson Memorial, *picture,* **2052;** 'The Old Shepherd's Chief Mourner', *picture,* **2641.**
**Lands End.** Promontory of Cornwall, forming westernmost point of England.
**Landshut** (*länts'hŭt*), Germany. Quaint old town on Isar R. in Bavaria, 35 mi. n.e. of Munich; pop. 25,000; from 1255 to 1503 cap. of duchy of Bavaria-Landshut; Napoleon defeated Austrians (1809).
**Lane, Franklin Knight** (1864–1921), U.S. sec. of the interior 1913–20; quoted on American flag, **1287.**
**Lane Theological Seminary,** at Cincinnati, Ohio, **766.**
**Lan'franc** (d. 1089). Eng. prelate and scholar, b. in Italy, archbishop of Canterbury 1070–89; as chief counselor of William the Conqueror played important part in fixing Norman rule upon Eng. church and people.
**Lang, Andrew** (1844–1912). Brit. scholar, poet, and writer on many subjects ('Ballads in Blue China'; 'Custom and Myth'; 'History of Scotland'; 'Blue', 'Red', 'Yellow', and other fairy books).
**Langdon, William Chauncy** (born 1871), Amer. pageant dramatist; quoted, **2626.**
**Langensalza** (*läng-ĕn-zäl'tsà*), Germany. Town in Saxony on R. Salza, 19 mi. n.w. of Erfurt; pop. 13,000; Hanoverians defeated Prussians in 1866, but capitulated on arrival of Prussian reinforcements.
**Langland, William** (1330?–1400?). Eng. poet, supposed author of 'Vision of Piers Plowman', a religious allegory attacking corruption in church and state.
**Langley, Samuel Pierpont** (1834–1906), American astronomer and physicist, b. Roxbury, Mass.; inventor of first heavier-than-air flying machine, **56, 1222;** "Langley's Folly," *picture,* **55.**
**Langobards** ("long beards"). *See in Index* **Lombards.**
**Langres** (*läṅ'gr*). Anc. town in e. France on "Plateau of Langres"; pop. 7000; makes cutlery; famous strategic point since Rom. days.
**Langshan,** a breed of fowls, **2911,** *picture,* **2909.**
**Langton, Stephen** (1150?–1228), Eng. cardinal and archbishop of Canterbury, usually credited with being the first to divide the Bible into chapters; in Eng. politics, **1896.**
**Langtry, Lily (Emily)** (born 1852). Eng. actress, noted for her beauty, b. Isl. of Jersey and known as the "Jersey lily"; first great success in 'She Stoops to Conquer'.
**Languages, 2770–2;** of Africa, **37;** of Europe, **1192;** romance, **3040;** sign, **970;** slang, **3248;** universal, **1177, 1965.** *See also in Index* the principal languages of the world under their own names; *see also* **Grammar.**
**Languedoc** (*läṅg-dŏc'*), former province in s. France, whose cap. was Toulouse; **1344, 1346,** *map,* **1351;** origin of name, **1363.**
**Langue d'oc,** Fr. dialect, **1363.**
**Languedoc Canal** or **Canal du Midi, 625, 1346.**
**Langue d'oïl** (*läṅg dō-ēl'*), Fr. dialect, **1363.**
**Lanier** (*là-nēr'*), **Sidney** (1842–81), Amer. lyric poet, **1961–2, 113, 1432.**
**Laniidae** (*là-nī'ĭ-dē*), the shrike family, **412, 3225,** *picture,* **419.**
**Lankester, Sir Edwin Ray** (born 1847). Eng. biologist, widely known for his delightfully entertaining writings ('Science from an Easy Chair'; 'Secrets of Earth and Sea').
**Lans'downe, Henry Petty-Fitzmaurice, 3d Marquis of** (1780–1863). Eng. statesman, chancellor of the exchequer at 25, a Liberal leader and advocate of parliamentary reform, abolition of slavery, free trade, and Catholic emancipation.
**Lansdowne, Henry Petty-Fitzmaurice, 5th Marquis of** (born 1845). Eng. statesman, gov.-gen. of Canada 1883–88; viceroy of India 1888–93; sec. of state for war 1895–1900; sec. for foreign affairs 1900–05; minister without portfolio 1915–16; Unionist leader in House of Lords 1905–16.
**Lan'sing, Robert** (born 1864). Amer. lawyer and authority on international law, b. Watertown, N.Y.; counsel for U.S. in Bering Sea and Alaska boundary arbitrations; sec. of state in Wilson's cabinet during World War (1915–20).
**Lansing,** Mich., cap. on Grand R. 80 mi. n.w. of Detroit; pop. 57,327; automobiles, agricultural machinery; Michigan Agricultural College; **2224, 2227;** capitol, *picture,* **2225.**

**Lantern,** of lighthouse, **2004.** *See also in Index* **Lamps and lighting.**
**Lantern, magic,** or stereopticon, **3353–4.**
**Lantern fish,** a name given to certain soft-rayed deep-sea fishes which have phosphorescent luminous organs to help them to see in the depths of the ocean; many of them are of grotesque shape with huge heads, enormous eyes, large mouths, and slender fragile bodies; *picture,* **2557.**
**Lan'thanum,** a lead-gray metallic element, **4042.**
**Lanuvium** (*lă-nū'vĭ-ŭm*) (modern Civita Lavinia). Anc. city of Latium, 19 mi. s.e. of Rome; member of Latin League; conquered by Rome 338 B.C.; temple of Juno.
**Laoag** (*lou-äg'*), Philippine Isls. Seaport on Laoag R. near n.w. coast of Luzon; pop. 50,000; trade in rice, indigo, tobacco, sugar.
**Laocoön** (*lā-ŏk'ō-ŏn*), in Gk. myth., Trojan priest of Apollo; warns countrymen against wooden horse, **3544;** statue of, **3055, 1532, 2222.**
**Laodicea** (*lā-ŏd-ĭ-sē'ä*) or **Laodicea ad Lycum.** Anc. city (modern Latakia), wealthy trade center, 120 mi. s.e. of Smyrna; one of 7 primitive churches of Asia; Synod of Laodicca in 4th cent. decided religious questions.
**'Laokoön'.** A book by Lessing (1766), in which the functions of poetry and painting are defined and distinguished; one of the most important books in the history of art.
**Laomedon** (*lā-ŏm'ĕ-dŏn*), in Gk. myth., founder and king of Troy; father of Priam; engages Poseidon to build wall around Troy, **2891.**
**Laon** (*lä-ôn'*), city in France, 80 mi. n.e. of Paris; pop. 15,000; fortified by Romans; Blücher defeated Napoleon 1814; captured by Germans 1870 and 1914; recovered by Allies, **3806.**
**Laos** (*lä'ōs*) or **Laotians,** a people of Indo-China; division of Thai or Shan race; **1777, 3227.**
**Laos,** Fr. protectorate in Indo-China; 98,000 sq. mi.; **1777.**
**Lao-Tse** (*lä'ō-tsē'*) (born 604? B.C.), Chinese philosopher, founder of Taoism; it is recorded that he interviewed Confucius in 517 B.C., but death date is unknown; **2993–4, 744.**
**La Paz** (*lä päz*), largest city and seat of govt. of Bolivia, S. Amer.; pop. 107,000; commercial center of agricultural and mining region; univ.; **449;** climate, **3285.**
**La Paz,** port, cap. of Lower Calif. in s. on Bay of La Paz; pop. 5000; **587.**
**Lap'idary,** a worker in precious stones, **1410.**
**Lapis lazuli** (*lā'pĭs lăz'yu-lī*), a semiprecious stone, **1409, 1411.**
**Lapithae** (*lăp'ĭ-thē*), in Gk. myth., race related to the Centaurs, dwelling in Thessaly; Centaurs battle, **678;** and Theseus, **3487.**
**Laplace** (*lä-pläs'*), **Pierre Simon, Marquis de** (1749–1827), Fr. mathematician and astronomer, called "Newton of France"; proved stability of solar system; formulated the nebular hypothesis, **2818–9, 2433** ('Mécanique céleste').
**Lap'land,** region in extreme n. of Norway, Sweden, Finland, and Russia, **1962,** *maps,* **1196–7, 2531;** in Norway, **2534;** reindeer, **2993;** in Sweden, **3403.**
**La Plata** (*lä plä'tä*), Argentina. City 35 mi. s.e. of Buenos Aires, 5 mi. from port of Ensenada on La Plata estuary; pop. 90,000; National Univ.
**La Plata, Rio de.** *See in Index* **Plata River.**
**Laporte',** Ind. City 59 mi. s.e. of Chicago near several lakes; pop. 15,158; woolen goods, agricultural implements, slicing machines, baby carriages, bicycles, pianos.
**Lap'pa,** or burdock, **3172;** seeds, *picture,* **3172.**
**Lap'pet moth,** moth of the silkworm family; so named because larvae have lobes or lappets at sides of bodies, *picture,* **1785.**
**Lapps,** natives of Lapland, **1962, 2534, 3403.**
**Lapu'ta,** in 'Gulliver's Travels', an isl. visited by Gulliver, **3409.**
**Lapwing.** A plover-like Old World bird, having lustrous plumage on upper parts, and crested head; noted for its wailing cry; its eggs are the "plovers' eggs" esteemed as delicacy.
**Lar'amie,** Wyo., trade center on Laramie R.; pop. 6300; oil, livc stock, dairying, and lumber interests; **3822;** state univ. buildings, *picture,* **3821.**
**Laramie Mts.,** in s.e. Wyo.; highest point 9020 ft.; **3036.**
**Larch,** a conifer tree which sheds its leaves seasonally, **1962–3;** not an evergreen, **1208.**
**Larcom, Lucy** (1826–93). Amer. poet and story writer, b. Beverly, Mass.; in youth a Lowell factory operative.
**Lard,** rendered pork fat, **1227;** in oleomargarine, **2577, 2578, 2579.**
**Lare'do,** Tex., port on Rio Grande R. about 140 mi. w. of San Antonio; agricultural and stock-raising, iron ore and coal interests; pop. 22,710; concentrating and sampling works, brick yards, foundries; **3477.**
**Lares** (*lā'rēz*), in Rom. myth., protecting deities closely associated with the Penates, **3635.**
**Largo** (*lar'gō*), a slow musical movement; in the sonata, **2379.**
**Largs** (*lärgz*), Scotland, watering place in Ayrshire, on Firth of Clyde; 30 mi. s.w. of Glasgow; yachting center; battle of (1263), **3489.**
**Laridae** (*lăr'ĭ-dē*), bird family including gulls and terns, **1550.**
**Larissa** (*lä-rĭs'ä*), Greece. City in Thessaly on Salambria R.; pop. 18,000; transit trade, textile mfrs.; important city in anc. times; center of mobilization in Balkan Wars.
**Lark,** a European bird that sings while flying, **1963;** care of young, **408;** courtship flights, **405;** horned, *picture,* **420;** meadow, **2179.**
**Lark family** of birds, the *Alaudidae,* **412,** *picture,* **420.**
**Lark sparrow.** Bird of middle w. U.S., head streaked chestnut and white; tail white-edged; good singer; also called lark finch.
**Larkspur,** plant with spikes of blue flowers, **1963,** *picture,* **2853;** poisonous properties, **2854.**
**Larnaka** (*lär'nä-kä*). Chief seaport of Cyprus on s.e. coast; pop. 9000; on site of anc. Citium.
**La Rochefoucauld** (*lä rōsh-fu-kō'*), **François Duc de** (1613–80). Fr. courtier, type of old noblesse, unrivaled maxim writer.
**La Rochelle** (*lä rō-shĕl'*), fortified seaport of w. France; pop. 36,000; once great maritime city and center of Fr. Protestantism; **1637;** besieged by Richelieu, **3018, 3488.**
**La Rothière** (*lä-rō-tyêr'*). Village in France, 125 mi. s.e. of Paris; Allies under Blücher defeated French under Napoleon (1814).
**Lar'va,** any young insect or other animal which attains adult form by going through a marked transformation, **1964, 1785–6;** of bee, **359–64,** *pictures,* **1787;** of beetles, **368–70;** caterpillars, **660–2;** distinguished from insect nymphs, **1786;** of fly, **1312,** *pictures,* **1313, 1789;** of mosquito, *pictures,* **2335;** not a worm, **3813;** silkworm, **3236–7;** tadpoles of frogs and toads, **1373–4, 3507;** wasp, *picture,* **3692.**
**Larynx** (*lăr'inks*), the voice organ, **3656–7;** location, *picture,* **2083.**
**La Salle** (*lä säl'*), **Rene Robert Cavelier, Sieur de** (1643–87), Fr. explorer, **1964–5;** explorations, *map,* **3605;** and Hennepin, **1632;** in Ill.; **1731, 1736;** in Ind., **1762;** prophecy at site of Chicago, **723;** voyage down Mississippi, **1964, 2072, 1900, 3468.**
**La Salle,** Ill. Mfg., trade, and mining center on Illinois R., 75 mi. s.w. of Chicago; pop. 13,050; coal mining, zinc smelting, and manufacture of sulphuric acid, cement, clocks, brick, etc.
**Las Casas** (*läs kä'säs*), **Bartolomé de** (1474–1566), Span. historian and missionary to W. Indies, **1965.**
**Las Cruces** (*läs krų'sĕs*), N.M., town 40 mi. n.w. of El Paso, Tex.; pop. 3969; **2467.**
**Las'ker, Edouard** (1829–84). Prussian statesman; played a prominent part in civil consolidation of Ger. empire.
**Las Navas de Tolosa** (*läs nä'väs dā tō-lō'sä*), **battle of** (1212), **3304.**
**Las Palmas** (*läs päl'mäs*). Important port on e. coast of Grand Canary Isl. (Spanish); pop. 70,000; largest city and former cap. of the group; cable station.
**Lassalle** (*lä-säl'*), **Ferdinand** (1825–64). Famous Ger. socialist, founder of Ger. social democratic movement; his vivid paradoxical personality and life formed basis of Meredith's 'Tragic Comedians'.
**Lassen** (*läs'ĕn*), **Park,** National park in n. Calif., 124 sq. mi., created in 1916; contains Lassen Peak.
**Lassen Peak,** volcanic peak of Sierra Nevadas in n. Calif.; vast lava beds; 10,437 ft.; **3231.**
**Last,** in shoe-making, **3222.**
**'Last Judgment, The',** painting by Michelangelo, **2222.**
**Las Truchas** (*läs trų'käs*) **Mountain,** peak of Rocky Mts. in N.M., **3036.**
**'Last Supper, The',** painting by Leonardo da Vinci, **3644,** *picture,* **3643;** enamel by Jean Reymond, *picture,* **1147.**
**Las Ve'gas,** N.M., wool market and commercial center on Gallinas R., 40 mi. e. of Santa Fe; pop. 4304; **2466.**
**Latakia** (*lä-tä-kē'ä*), Syria. Mediterranean port 115 mi. n. of Beirut; pop. 25,000; produces famous Latakia tobacco; anc. Laodicea.
**La'tent heat,** heat absorbed or released when matter changes state, as when ice melts, **3696.**
**Lat'eran, The.** Palace in Rome, dating from 16th to 18th cents., now a museum; on site of anc. palace of Latcranus family appropriated by Nero; later given by Constantine to Bishop of Rome and used by popes as residence until 14th cent.
**Lateran Church,** or church of St. John Lateran, at Rome; built originally in Lateran palace by Constantine, **3057, 662.**
**Lateran Council,** of 1215, **763.**
**Latex** (*lā'tĕks*), milky juice secreted by various plants, **1554;** yields rubber, **3071.**
**Lathe** (*lāth*), a machine tool, **3514,** *pictures,* **3516.**
**La'throp, Julia Clifford** (born 1858). Amer. social worker; chief 1912–21 of Children's Bureau of U.S. Dept. of Labor; first woman bureau chief.
**Lat'imer, Hugh** (1490?–1555). Eng. Protestant reformer and martyr.

bishop of Worcester, whose homely practical preaching largely drove the Eng. Reformation home to the people; burned at stake in Smithfield exhorting his fellow-martyr, "Be of good cheer, Master Ridley, and play the man; we shall this day light such a candle by God's grace in England as I trust shall never be put out."

**Latin America.** Collective name for Mexico and countries of S. and Cent. Amer.

**Latin Empire,** established by Crusaders in 1204, **932.**

**Latin language, 1965–6;** alphabet, **101;** Bible translation, **389;** effect of Renaissance on study of, **2995–6;** influence on English language, **1161–2;** pronunciation, **1968;** romance languages derived from, **3040, 2771, 1363, 1832–3;** value of study of, **1495.**

**Latin League,** confederation of cities of Latium in cent. Italy, existing from earliest historic times till 338 B.C., **3044.**

**Latin literature, 1966–8;** Augustan Age, **258;** Caesar, **565;** Cicero, **766;** drama, **1033, 1038;** Renaissance, **2996;** Vergil, **3630.**

**Latin Quarter,** Paris, **2682.**

**Latins,** in anc. times, inhabitants of Latium, in cent. Italy, **1842;** early history, **3040–2, 3044, 29.**

**Latin School,** Boston, **471.**

**Lat'itude,** distance in degrees from equator, **1968–9;** first determination 200 B.C., **1064;** "horse latitudes," **3750,** *picture,* **3751;** how found at sea, **2420;** shown on maps, **2142–3.**

**Latium** (*lā'shĭ-ŭm*), anc. dist. in middle of w. coast of Italy, inhabited by Latins, **3040, 3041, 29.**

**Lato'na,** in Rom. myth., mother of Apollo and Diana; same as Gk. Leto; **2510.**

**Latter-Day Saints.** *See in Index* **Mormons.**

**Lat'via** or **Letvia,** republic on Baltic Sea; pop. 1,500,000; 20,000 sq. mi.; cap. Riga; **1969,** *maps,* **1196–7, 2858;** Riga, **3019–20;** woman suffrage, **3779.**

**Laud, William** (1573–1645), Eng. prelate, archbishop of Canterbury; harried and tried to suppress dissent; beheaded on charge of treason; as adviser of Charles I, **691;** and Oxford, **2609.**

**Lau'danum,** alcoholic tincture of opium, **2585;** treatment for poisoning, **1270, 2855.**

**Lauder, Sir Harry Maclennan** (born 1870). Brit. variety actor, a great favorite for his Scotch songs composed by himself and sung in character; aided recruiting in World War, for which he was knighted 1919.

**Laughing gas,** or nitrous oxide, an anesthetic, **124, 125;** discovered by Davy, **969.**

**Laughing gull,** a small Amer. type, **1550,** *picture,* **2709.**

**Laughing jackass,** an Australian bird, **266.**

**Laughing Philosopher.** *See in Index* **Democritus.**

**Launceston** (*lăn'sĕs-tŏn*), England. Quaint old town in Cornwall 21 mi. n.w. of Plymouth; pop. 4000; George Fox, the Quaker, imprisoned here in 1655.

**Launceston.** Second city of Tasmania in n.e. on Tamar R.; pop. (with suburbs) 24,000; commerce with Victoria and S. Australia.

**Laundry, 1969;** centrifugal drier, **682;** machinery, manufactures, **3545.**

**Launfal** (*lạn'fȧl*), **Sir.** Knight of the Round Table and steward to King Arthur, in the Arthurian legends; hero of Lowell's 'Vision of Sir Launfal'.

**La Union** (*ụ-nĭ-ōn'*), Salvador, thriving town on Union Bay at e. end of Salvador; pop. 3500; **3119.**

**Laura** (1308–48), lady loved by Petrarch and celebrated in his poems, **2995, 1833.**

**Lauraceae** (*lạ-rā'sĕ-ē*), or laurel family, of plants, **3941;** includes camphor, **594;** cinnamon, **3318;** European laurel, **1970;** sassafras, **3129.**

**Lau'reate** (poet laureate), **2848.**

**Laurel,** Miss. Commercial and mfg city 76 mi. s.e. of Jackson; pop. 13,037; owes rapid growth to large sawmills; makes cotton and cottonseed-oil, bricks, knitted goods.

**Laurel,** name given various flowering shrubs, **1970;** cherry laurel, *picture,* **2853;** leaves sacred to Apollo, **962.**

**Laurel magnolia,** a magnolia with small leaves and flowers, **2123.**

**Lau'rens, Henry** (1724–92). Amer. statesman, b. Charleston, S.C.; pres. of Continental Congress 1777–78; father of John Laurens (1754–82), called the "Bayard of the Revolution."

**Laurens, Jean Paul** (1837–1921), Fr. historical painter; bust by Rodin, *picture,* **3162.**

**Lauren'tian Plateau,** highland area in Canada, **1970, 2358, 2516,** *map* facing **2514.**

**Laurentides National Park,** Canada, in Laurentian Highlands 15 mi. n. of Quebec, **2400.**

**Laurier** (*lō'rĭ-ā*), **Sir Wilfrid** (1841–1919), Canadian statesman, **1971, 620;** quoted, **601.**

**Lau'rium** or **Laurion,** Greece, hill range forming s.e. part of Attica 20 mi. below Athens; silver mines, **1527, 1522, 3242.**

**Lausanne** (*lō-zăn'*), Switzerland, beautiful city 1 mi. n. of L. Geneva; pop. 68,000; 13th cent. cathedral; univ.; long the home of historian Gibbon; **3416, 1412.**

**Laut, Agnes C.** (born 1871), Canadian author, b. Stanley, Ontario; historical works, **625.**

**Lauterbrunnen** (*lou'tĕr-brụn-ĕn*), Switzerland, Alpine village 34 mi. s.e. of Bern; pop. 2500; *picture,* **3414.**

**Lava** (*lä'vȧ*), melted rock discharged from volcanoes, **1971–2, 3657, 3658;** forms igneous rock, **1417;** Herculaneum buried, **2877–8;** Idaho beds, **1725;** Vesuvius eruptions, **3635.**

**Lavalleja, Juan Antonio** (d. 1853). Liberator of Uruguay from Brazilian rule 1825–28; dictator 1827–28; insurgent against later govts.

**Laval-Montmorency** (*lȧ-vȧl'-môn-mō-rän̈-sē'*), **François Xavier de** (1622–1708). First Rom. Cath. bishop of Quebec; remarkable influence largely determined paternalistic character of Fr. colonial govt.; founded (1663) Seminary of Quebec; Laval Univ. named in his honor.

**Laval University,** at Quebec, Que.; men, Rom. Cath.; founded 1852 by the Seminary of Quebec (1663); theology, law, medicine, arts; various affiliated schools; **2948, 833.**

**Lavater** (*lä-vä'tĕr*), **Johann Kaspar** (1741–1801). Swiss poet and mystic, founder of "science" of physiognomy, which professes to read character by outward appearance.

**Lav'ender,** an aromatic shrub native to s. Europe; of the mint family, **2258;** preparation of perfume, *pictures,* **2727.**

**Laveran** (*lä-vē-rän̈'*), **Charles** (born 1845). Fr. physician; awarded Nobel prize (medicine) in 1907; discovers malaria parasite, **2335.**

**Lavin'ium.** Anc. town of Latium, 17 mi. s. of Rome; said to have been founded by Aeneas and named after his wife Lavinia.

**Lavoisier** (*lä-vwä-zyā'*), **Antoine Laurent** (1743–94). Fr. chemist; founded modern theory of chemical compounds; **1249, 2612, 3743.**

**Law, Andrew Bonar** (born 1858). Brit. statesman, b. New Brunswick; made fortune as iron merchant; in House of Commons after 1900; leader of Unionist party from 1911; in coalition cabinet as sec. for colonies 1915–16, chancellor of exchequer 1916–18; delegate to Peace Conference 1919; succeeded Lloyd George as premier October 1922.

**Law, John** (1671–1729), Scotch financier; controller-general of Fr. finance; "Mississippi Bubble," **2072.**

**Law, 1972;** bankruptcy, **326–7;** commercial, origin, **1219;** in Gt. Brit., how made, **2687–9;** Greek codes, **1521, 2086, 3274–5;** Habeas Corpus, **1557;** Hammurabi's code, **296;** Henry II reforms, **1633;** international, **1794;** Louisiana code, **2071;** Justinian's code, **1905;** Mohammedan, **1942;** Napoleon's code, **2394, 3778;** Roman, **1972;** in U.S., how made, **860–2, 909, 3346, 3594;** veto, **3636.** *See also in Index* **Government; International law; Factories and factory laws;** etc.

**Law, The,** division of the Old Testament, **2923.**

**Lawn,** a bleached fabric, **435.**

**Lawn tennis, 3469–70,** *pictures,* **3471.**

**Lawrence, Abbott** (1792–1855), Amer. manufacturer and diplomat, b. Groton, Mass.; minister to Gt. Brit. 1849–52; founded Lawrence Scientific School of Harvard; Lawrence, Mass., named for, **1973.**

**Lawrence, David Herbert.** Eng. novelist and poet, with extreme views on woman and her position in the social structure; 'Women in Love', 'The Lost Girl', 'Aaron's Rod', 'The White Peacock', are among his best novels.

**Lawrence, Sir Henry Montgomery** (1806–57), Eng. brigadier-general and colonial administrator, **1753, 2075.**

**Lawrence, James** (1781–1813), Amer. naval hero, **1972–3, 3672.**

**Lawrence, John L. M., Baron** (1811–79). Brit. viceroy and gov.-gen. of India, called "savior of India" because his relief of Delhi during the Mutiny (1857) maintained Brit. dominion; brother of Sir Henry Lawrence.

**Lawrence, Saint** (d. 258? A.D.), "the Deacon," Christian martyr; called on by the judge to produce the church's treasures, produced the poor people in his care; said to have been roasted to death on a gridiron, **2156, 2110.**

**Lawrence, Sir Thomas** (1769–1830). Eng. court painter; flattering but often superficial likenesses of Eng. beauties and European sovereigns; the successor of Reynolds as the most celebrated portrait painter of his day.

**Lawrence,** Kan., farming and mfg. center on Kansas R. 33 mi. w. of Kansas City; pop. 12,456; Haskell Institute for Indians; manufactures, **1911;** state univ., *picture,* **1912.**

**Lawrence,** Mass., one of chief textile-mfg. cities in U.S.; pop. 94,270; on Merrimack R. 30 mi. from the sea; **1973.**

**'Lawrence',** Perry's flagship; in battle of L. Erie, **2730,** *picture,* **3671.**

**Lawrence College.** Co-ed. Meth. Episc. institution at Appleton, Wis.; founded 1847; college of liberal arts, conservatory of music; named for Amos A. Lawrence (1814–86), a Boston merchant who was its chief founder.
**Lawson, Henry** (born 1867), Australian poet, **268.**
**Lawson spruce,** a Pacific coast cypress, **946.**
**Lawton, Henry Ware** (1843–99). Amer. general, b. Manhattan, Ohio; in Civil War rose from sergeant to brevet-colonel; commanded Amer. troops which took El Caney in Cuba in 1898; killed in attack upon Filipinos at San Mateo, Luzon.
**Lawton,** Okla. Industrial city 80 mi. s.w. of Oklahoma City, in irrigated agricultural dist.; pop. 8936; cotton products, brooms, mops, cigars; oil interests; Ft. Sill near by.
**Lay'ard, Sir Austen Henry** (1817–94), Eng. diplomat, archeologist, and writer; excavated ruins of Nineveh ('Monuments of Nineveh'); **2510.**
**'Lay of the Last Minstrel',** poem by Scott, **3151.**
**'Lays of Ancient Rome',** four ballads by Macaulay, **2094;** 'How Horatius Kept the Bridge', story, **3494.**
**Laz'arus.** Beggar in parable of the rich man and the poor man (Luke xvi, 19–30).
**Lazarus.** Brother of Martha and Mary; raised from the dead by Christ (John xi).
**Lazear, Jesse W.** (d. 1900), Amer. physician, **2336, 3145.**
**Lea** (*lē*), **Henry Charles** (1825–1909). Amer. publisher and church historian, remembered for 'A History of the Inquisition of Middle Ages' and 'History of the Inquisition of Spain', the standard books in English in their fields.
**Leacock, Stephen Butler** (born 1869), Canadian educator and humorist, b. England; professor of political economy at U. of Chicago and later at McGill; author of biographies of Robert Baldwin, La Fontaine, and Hincks; won a new and wider public with his delightful nonsensical sketches ('Literary Lapses'; 'Behind the Beyond'; 'Moonbeams from the Larger Lunacy'); **624–5.**
**Lead,** S.D., city in Black Hills mining dist.; pop. 5013; Homestake mine, **3297,** *picture,* **3295.**
**Lead,** a heavy metallic element, **1973–4;** in alloys, **99, 428, 3572;** attacked by vinegar, **3644;** Bolivia, **450;** in flint glass, **1472;** melting point, **1362;** in paint, **2642–3;** pencils, **2712;** radioactive properties, **2961;** red lead, **2642, 2643;** in shotmaking, **220;** silver found in lead ores, **3590, 3242;** in Spain, **3302;** in storage batteries, **3362;** in type metal, **99, 3572;** in Wales, **3664;** white lead, **2642;** U.S. deposits, **3590, 2270, 3297, 3612, 3771, 3773.**—*Compounds:* acetate (sugar of lead), **3644, 1779;** arsenate, an insecticide, **3331;** carbonate (white lead), **2642;** chromate (chromium yellow), **2642;** monoxide (litharge), **2642;** oxide or "minium" (red lead), **2642;** sulphide, **3390.**
**Leadenhall Street,** London, **2051.**
**'Lead, Kindly Light',** hymn by Newman, **2462.**
**Lead pencils, 2712–4.**
**Leadville,** Colo. Mining city in w. center; pop. 4959; smelting and refining works, zinc-oxide reduction plant; trade in farm products
**Leaf.** *See in Index* **Leaves.**
**Leaf butterfly, 2924, 548,** *pictures,* **1785, 2925.**
**Leaf-chafer,** a plant-cating beetle, **369.**
**Leaf coral,** *picture,* **885.**
**Leaf-cutter bees, 363–4,** text facing **358;** *picture* facing **359;** eggs, *picture,* **1091;** mandibles, *picture,* **1782.**
**Leaf-hopper,** several bugs of the family *Jassidae,* which infest wheat, grapevines, roses, and other plants, **3330.**
**Leaf-insect.** An insect of tropical regions, with wings amazingly leaflike in form and color; family *Phasmidae.*
**Leaf rust,** a grain parasite, **3099.**
**League,** a unit of measure, **3715.**
**League of Nations, 1974, 3808, 3530;** compulsory arbitration, **172;** and Danzig, **962;** controls Dardanelles zone, **3560, 963;** health commission, **1615;** administers Saar basin, **1348;** Smuts advocates, **3254;** Taft supports, **3429;** rejected by U.S. Senate, **3749, 3812, 1580, 1582.** *See also in Index* **Mandatary; Plebiscite areas.**
**Le'ah.** Elder daughter of Laban and unloved first wife of Jacob (Gen. xxix).
**Leamington** (*lĕm'ĭng-tŏn*), England. Health resort in Warwickshire, 90 mi. n.w. of London; pop. 27,000; mineral springs.
**Lean'der,** in Gk. legend, lover of Hero, **1645, 963.**
**Leaning tower of Pisa, 2810, 1844, 1509.**
**Leap year, 574.**
**Lear,** hero of Shakespeare's tragedy 'King Lear', **1926,** *picture,* **3193.**
**Lear, Edward** (1812–88), Eng. artist and writer, famous for his nonsense verses and comic illustrations; made limerick popular, **2010.**
**Least bittern, 431.**
**Least sandpiper, 3261.**
**Least tern, 1550.**
**Least weasel, 3707.**
**Leather, 1975–9;** alligator hide, **98;** book bindings, **458;** chamois-skin, **686, 1977;** cordovan, **3302, 1977;** crocodile, **923;** goat skins, **1477;** morocco, **2328, 1097, 1977;** parchment and vellum, **2667;** patent, **1977;** pigskin, **1671;** preparation for gloves, **1475;** shagreen, **236;** shoe-making, **3320–3;** substitutes, **1977, 673;** Wis. industry, **3770.**
**Leather-back turtle, 3562–3.**
**'Leatherstocking Tales',** by Cooper, **878.**
**Leaven, 2821.** *See also in Index* **Yeast.**
**Leavened bread, 498.**
**Leav'enworth,** Kan., mfg. and shipping center in n.e. on Missouri R.; pop. 16,912; large coal interests; in suburbs are Ft. Leavenworth and state and U.S. penitentiaries; in early days outfitting point for cross-prairie wagon trains, **1911.**
**Leavenworth, Fort.** *See in Index* **Fort Leavenworth.**
**Leaves, 1980–2, 3535–7;** autumn coloration, **1981–2, 3537;** chlorophyll and its work, **2823, 2824, 1980;** compass plants, **855;** conifer types distinguished, **3539, 2809;** evaporation from, **1207, 3532;** fern fronds, **1232, 1234;** fly-catching leaves, **2829, 2811, 3396, 3626;** forerunners seen in algae, **92;** grow enclosed on tulip trees, **3547–8;** growth illustrated in buckeye, *pictures,* **2413;** how grasses resist drouth, **1503;** lacking in cactus, **562;** palm, **2647;** as respiratory organs, **2824;** sensitive to light and touch, **2828, 2829, 3174;** of water-lily, **3699,** *picture,* **474;** in water-plants, **3700.**
**'Leaves of Grass',** poems by Walt Whitman, **3734, 3735.**
**Leb'anon,** Pa. Industrial city 26 mi. n.e. of Harrisburg; pop. 24,643; in quarrying and iron-mining dist.; iron and steel mfrs.; settled in 1700 by Ger. immigrants.
**Lebanon Mts.,** Syria, n. of Palestine; Lebanon on w., Anti-Lebanon on e.; average height 7000 ft.; **3425;** famous cedars, **671.**
**Lebanon Valley College.** Co-ed. institution at Annville, Pa.; founded 1866 under auspices of the United Brethren; academic, music, and art courses.
**Leblanc** (*lē-blăn'*), **Nicolas** (1742–1806). Fr. chemist, won prize offered (1775) by Fr. Academy for method of making soda from common salt; lost property and patent rights in Fr. Revolution.
**Leblanc process, 3273, 3390;** development, **10;** made sodium supply inexhaustible, **3271.**
**Lebrun** (*lē-brŭn'*), **Elizabeth Vigée** (1755–1842), Fr. portrait and landscape painter; *picture,* **1203.**
**Lech** (*lĕĸ*) **River.** Rapid and tortuous stream rising in Vorarlberg Alps at height of 6120 ft.; flows n. through Bavaria 180 mi., joining Danube below Donauwörth.
**Lechfeld** (*lĕĸ'fĕlt*), **battle of,** fought on plain of Lechfeld in Bavaria (955 A.D.), **1703, 2606.**
**Leck'y, William E. H.** (1838–1903), Irish historian and publicist ('A History of European Morals'; 'History of England in the Eighteenth Century'); his opinion of George III, **1428, 1430.**
**Leclaire** (*lē-klĕr'*), **E. J.** (1801–72). Fr. social scientist; founded system of profit-sharing.
**Lecompton,** Kan. Town on Kansas R., 15 mi. e. of Topeka; pop. 310; settled 1854 by pro-slavery men and was their headquarters during contest with free-state settlers for control of the state.
**Lecompton constitution,** constitution adopted by pro-slavery faction of Kansas in 1857, **522.**
**Le Conte** (*lē kŏnt*), **Joseph** (1823–1901). Amer. scientist, b. Liberty County, Ga.; helped popularize geology in America ('Elements of Geology'; 'Religion and Science').
**Leconte de Lisle** (*lē-kônt' dē lēl*), **Charles Marie** (1818–94). Fr. poet, chief of modern Parnassian school ('Poems antiques'). "Coldness cultivated as a kind of artistic distinction seems to turn all his poetry to marble in spite of the fire at his heart."
**Le Creusot** (*krû-sō'*), town in e.-cent. France, 75 mi. n.w. of Lyon, **1348.**
**Ledger, 5–7.**
**Lee, Ann** (1736–84). Founder of the Amer. Society of Shakers, b. England; called by her followers "Mother Ann."
**Lee, Charles** (1731–82), Amer. Rev. general, b. England; dismissed for insubordination; involved in treasonable intrigues not discovered until after his death; at Monmouth Court House, **3004.**
**Lee, Fitzhugh** (1835–1905). Amer. Confederate Civil War general, b. Fairfax County, Va.; nephew of Robert E. Lee; military gov. of Havana after Span.-Amer. War.
**Lee, Henry** (1756–1918). Amer. Rev. soldier, called "Light Horse Harry," b. Dumfries, Va.; gov. of Va. and author of eulogy calling Washington "first in war, first in peace, and first in the hearts of his countrymen"; father of Robert E. Lee.
**Lee, Jason,** missionary to Indians in Ore., **2598.**

**Lee, Richard Henry** (1732–94), Amer. Rev. leader, **1982, 3593.**

**Lee, Robert E.** (1807–70), Confederate general, **1982–4,** *picture,* **1453;** at Antietam, **149, 2095;** captures John Brown, **516;** at Fredericksburg, **1361;** at Gettysburg, **1453–4, 2179;** and Grant, **1498–9;** surrender, *picture,* **781.**

**Lee, Sir Sidney** (born 1859). Eng. author and educator; editor 'Dictionary of National Biography'; works include 'Life of Shakespeare', 'Life of Queen Victoria'.

**Lee, William** (d. 1610), Eng. clergyman; invents knitting machine, **1935.**

**Lee,** small r. in County Cork, Ireland, **888.**

**Leech, John** (1817–64). Eng. caricaturist, whose *Punch* cartoons were called by Ruskin "the finest definition and natural history of the classes of our society, the kindest and subtlest analysis of its foibles."

**Leech,** a bloodsucking worm, **1984–5.**

**Leech Lake,** in n. Minnesota; 20 mi. long; *map,* **2254.**

**Leeds,** 6th largest city in England, on Aire R.; pop. 450,000; **1985, 1160.**

**Leeds and Liverpool Canal, 1985.**

**Lee-Enfield rifle, 1256,** *picture,* **1255.**

**Leek,** an herb, **2581.**

**Leeuwarden** (*lû'wär-dĕn*), Netherlands. Cap. of province of Friesland; pop. 43,000; flourishing trade in cattle, grain, fish; various mfrs.

**Leeuwenhoek** (*lû'vĕn-hu̯k*), **Anthony van** (1632–1723), Dutch microscopist, **2228;** discovers capillary blood-vessels, **438.**

**Leeward Islands.** Brit. colony in W. Indies n. of Windward Isls. and s.e. of Porto Rico, comprising Antigua, St. Kitts, Novis, Dominica, Montserrat, and part of Virgin Isls.; 715 sq. mi.; pop. 127,000; name sometimes applied to other W. Indian isls., also to chain w. of Trinidad.

**Left,** term used in European politics, **2869.**

**Left-handedness, 491.**

**Leg, 1322, 1324;** bones, *picture,* **3244;** caterpillars, **660;** crawfish, *picture,* **915;** duckbill's poison spurs, **1046–7;** evolution in horse, *pictures,* **1682;** first aid when broken, **1268;** insects, **1787,** *pictures,* **1788, 548, 2229;** muscles, **2372,** *picture,* **2373;** spider, **3326.**

**Le Gallienne** (*găl-lĭ-ĕn'*), **Richard** (born 1866). Amer. critic, essayist, and poet, b. Liverpool, England; 'Prose Fancies', 'The Quest of the Golden Girl', 'Pieces of Eight' are imaginative prose sketches; 'Odes from the Divan of Hafiz', 'English Poems', and other volumes of poems include many graceful lyrics.

**Legal tender,** money that may legally be offered in payment of debt, **2282;** gold coins in U.S., **2259;** greenbacks, **3605–6, 2282;** tobacco, **2281.**

**Lega'tion,** residence of a diplomatic minister, **1013.**

**'Legend of Sleepy Hollow, The',** story by Washington Irving, **1831.**

**Legerdemain** (*lĕ̆j-ẽr-dẽ-mān'*), or sleight of hand, **2121.**

**Legers, M.,** Fr. inventor, **1958.**

**Leg'horn** or **Livor'no.** Third commercial port in Italy, in Tuscany on w. coast; pop. 109,000; Leghorn straw hats, leather, glass, iron and copper products, anchovies; shipbuilding.

**Leghorn,** a breed of fowls, **2911,** *picture,* **2909.**

**Le'gion, American, 2695.**

**Legion of Honor,** Fr. order of merit, reward for civil and military services, **979,** *picture,* **977;** founded by Napoleon, **2394.**

**Leg'islative Assembly,** France, **1368, 2067.**

**Leg'islature,** the law-making body of any govt. unit; particularly of states of the U.S., **3346.** For other law-making bodies *see* under their proper names, as **Congress; Diet; Parliament;** etc.

**Legnano** (*lā-nyä'nō*), Italy. Town 16 mi. n.w. of Milan; pop. 24,000; cotton and silk mfrs.; **1176,** Lombard League defeated Frederick Barbarossa.

**Legree', Simon.** In Harriet Beecher Stowe's 'Uncle Tom's Cabin', a brutal slave-driver.

**Legros** (*lẽ-grō'*), **Alphonse** (born 1837). Fr. painter and etcher, for nearly 30 years a teacher in London, where his severe yet dignified realism and simple technique exerted powerful influence in development of Eng. art.

**Legumes** (*lẽ̆g'yu̯ms*), pod-bearing plants of pea and bean type, forming family *Fabaceae* or *Leguminosae,* **2698, 3941;** alfalfa, **88–9;** beans, **347–9;** clover, **809–10;** cowpea, **910;** importance as fertilizers, **1235;** partnership with nitrifying bacteria, **2829–30, 2511–2;** peas, **2698;** soy bean, **3297;** used as hay, **1609.**

**Legu'min,** a protein from legumes, **2926.**

**Leguminosae** (*lẽ-gu̯ū-mĭ-nō'sẽ*). Same as **Fabaceae.**

**Le Havre.** Same as **Havre.**

**Le'high University.** Non-sectarian institution for men at Bethlehem, Pa.; founded 1866; depts. of arts and science and technology.

**Lehigh Valley,** Pa., **676.**

**Lei** (*lā'ē*), a wreath or rope of flowers worn by Hawaiians, **1602.**

**Leibnitz** (*līp'nĭts*), **Gottfried Wilhelm** (1646–1716), Ger. philosopher, mathematician and scientist, "the most universal scientific genius of modern times"; invention of calculus, **2478.**

**Leicester** (*lĕs'tẽr*), **Robert Dudley, Earl of** (1531?–88), Eng. statesman and soldier, favorite of Elizabeth, **1138, 3189.** His supposed secret marriage to Amy Robsart is the theme of Scott's 'Kenilworth'.

**Leicester, Simon, Earl of.** *See in Index* **Montfort, Simon de.**

**Leicester,** England. City, cap. of Leicestershire, on Soar R., 90 mi. n.w. of London; pop. 246,000; hosiery, boots and shoes, lace; Rom. remains.

**Leicester,** breed of sheep, **3200.**

**Leicestershire,** England. N. Midland County; 832 sq. mi.; pop. 508,000; agriculture, stock-raising.

**Lei'den.** *See in Index* **Leyden.**

**Leighton** (*lā'tŏn*), **Frederick, Baron** (1830–96), Eng. painter, **2632;** paintings by, *pictures,* **992, 1523, 2152.**

**Leinster** (*lĕn'stẽr*). One of 4 provinces of Ireland, in middle and s.e. part; 7575 sq. mi.; pop. 1,162,000.

**Leipzig** (*līp'sĭk*), Germany, city 70 mi. n.w. of Dresden; pop. 605,000; great book-publishing center; **1985, 3131–2;** artesian well, **222;** fair, **1219, 1220.**

**Leipzig, battle of** (1631). *See in Index* **Breitenfeld.**

**Leipzig, battle of** (1813), **2396.**

**Leipzig, University of,** 3d in size and 2d in age of the universities of Germany; established by 400 teachers and students who seceded from U. of Prague as result of Hussite agitations; faculties of medicine, law, theology, and philosophy; **1985, 832.**

**Leisler** (*līs'lẽr*), **Jacob** (1635?–91), popular leader in colonial N.Y., b. Germany; **2497.**

**Leith** (*lēth*), Scotland, seaport and mfg. city on Firth of Forth, 2 mi. n. of Edinburgh, of which it is port; pop. 84,000; shipbuilding; **3147.**

**Leitrim** (*lē'trĭm*). County in Connaught province, Ireland; 613 sq. mi.; pop. 64,000; lost more by emigration than any other county; much of land is poor, but scenery is beautiful, especially along R. Shannon; organized as county 1583.

**Le Jeune** (*zhŭn'*), **John A.** (born 1867). Maj.-gen. U.S. Marine Corps; graduated U.S. Naval Academy 1888; commanded marine brigade at capture of Vera Cruz 1914; commanded 2d Division, A.E.F., July 28, 1918, to Aug. 8, 1919.

**Le'land, Charles Godfrey** (1824–1903). Amer. poet, ethnologist, traveler, and pioneer educator in art handicraft, b. Philadelphia ('Hans Breitmann's Ballads', poems in Pennsylvania Dutch dialect).

**Leland Stanford Junior University,** at Palo Alto, Calif.; co-ed.; opened 1891 (endowed 1885); arts and science, law, medicine, engineering; **1086,** *picture,* **581.**

**Lely** (*lē'lĭ*), **Sir Peter** (1617–80). Eng. court painter, b. Germany, of Dutch family; famous for portraits of beautiful women of court of Charles II.

**Le'man, Henry** and **Peter,** Amer. inventors, **1254.**

**Leman, Lake.** Same as **Geneva.**

**Le Mans** (*lẽ mäṅ*). Commercial and mfg. town in n.w. France on R. Sarthe, 115 mi. s.w. of Paris; pop. 70,000; French under Gen. Chanzy defeated 1871 by Germans under Prince Frederick Charles.

**Lemberg** (*lĕm'bẽrĸ*), Poland, city 185 mi. e. of Cracow; mixed pop. 207,000; formerly cap. Austrian Galicia; univ.; strategic point in World War, held by Russians (1914–15); **2857, 271.**

**Lem'ming,** a small rodent, **2359;** migrations, **2234,** *picture,* **2233.**

**Lemmon slave case, 222.**

**Lem'nos,** isl. in n. Aegean; 150 sq. mi.; pop. 30,000; held in turn by anc. Greeks, Byzantine Empire, Italians, and Turks; Gk. since World War; anc. Gk. colony, **1520;** home of Hephaestus, **1639.**

**Lemon,** a citrus fruit, **1985–6,** *picture,* **1226;** contains citric acid, **10;** introduced into Europe, **932;** "sympathetic" ink, **1779;** vitamin content, **3652.**

**Le Moyne** (*lẽ mwän*). Famous family of Fr.-Canadian explorers and soldiers, members of which (father and 7 sons) are better known by territorial titles. *See in Index* **Bienville; Iberville.**

**Lemur** (*lē'mŭr*), a fox-faced monkey-like animal, **1986;** altitude range, *picture,* **397;** evolutionary position, **345,** *diagram,* **128.**

**Lenape** (*lĕn'à-pē*), Indian tribe, **1765.**

**Lenard** (*lē-närt'*), **Philipp von** (born 1862), Hungarian physicist; head of radiological institute at Heidelberg 1909; Nobel prize for physics 1905 ('On Cathode Rays'); **3824.**

**Lena River,** Siberia, rises in Baikal Mts. in s.; empties into Arctic Ocean, forming vast delta; length 2860 mi.; **230, 3228.**

**L'Enfant** (*läṅ-fäṅ'*), **Pierre Charles, Major** (1755–1825), Fr. engineer, planned city of Washington, D.C., **3680.**

**Lenin** (*lyĕ'nĭn*), **Nikolai** (born 1870), Rus. Bolshevist leader, **1986, 450, 3798;** and Trotzky, **3544, 3545.**

**Lenoir** (*lē-nwär'*), **Etienne** (1822–1900), Fr. inventor, **1404.**
**Lenox,** Mass. Town in Berkshire Mts., 6 mi. s. of Pittsfield; pop. 2691; noted for picturesque scenery and beautiful country estates.
**Lens** (*läⁿ*), France, coal-mining and iron-mfg. city 135 mi. n.e. of Paris; pop. 32,000; victory of French under Prince of Condé over Spaniards 1648; in World War, **220.**
**Lens,** in optics, **1986–8;** aberrations (spherical and chromatic), **2228;** in camera, **2779;** crystalline, of eye, **1214,** *pictures,* **1214, 1216;** of Fittonia plant, **1305;** focuses heat, **1620;** limits of enlargement, **2229;** of microscope, **2228;** special glass, **1474;** of spectacles, **3310;** telescopes, **3462, 3463;** toric, **3310.**
**Lent,** in Christian church, **1070.**
**Len'til,** a leguminous plant, **1988, 2926.**
**Leo,** popes. For list *see in Index* **Pope.**
**Leo I, the Great** (390?–461), pope, **1988, 763.**
**Leo III** (750?–816), pope, **1988.**
**Leo IV** (800?–855), pope, **1988.**
**Leo IX** (1002–54), pope, **1988.**
**Leo X** (1475–1521), pope, **1988, 2191.**
**Leo XIII** (1810–1903), pope, **1988, 2666.**
**Leo** or **Lion,** a sign of the zodiac, **3840.**
**Leofric** (*lē-ŏf'rĭk*), earl of Mercia (d. 1057), husband of Lady Godiva, **910.**
**Leominster** (*lĕm'ĭn-stẽr*), Mass. Industrial city on Nashua R. 40 mi. n.w. of Boston; pop. 19,744; toilet articles, pianos, paper boxes, leather, clothing, toys.
**Leon, Ponce de.** *See in Index* **Ponce de Leon.**
**Le'on,** anc. kingdom and modern province of n.w. Spain, **1195, 1832, 3304,** *map,* **3300.**
**Leon,** Mexico. City 200 mi. n.w. of Mexico City; pop. 58,000; leather, textiles; trade in cereals.
**Leon,** Nicaragua, largest city and former cap.; pop. 74,000; founded 1610; large trade; univ.; **2505.**
**Leonardo da Vinci.** *See in Index* **Vinci, Leonardo da.**
**Leoncavallo** (*lā-ōn-kä-väl'lō*), **Ruggiero** (1858–1919). Ital. composer ('I Pagliacci'; 'La Bohème'); in early years strongly influenced by Wagner.
**Leonidas** (*lē-ŏn'ĭ-dȧs*), king of Sparta, killed 480 B.C. at Thermopylae, **2740.**
**Le'onids,** group of meteors, **2202, 2204.**
**Leon Springs,** Tex., 20 mi. n. of San Antonio; officers' training camp in World War; artillery range, **3121.**
**Leontes** (*lē-ŏn'tēz*), in Shakespeare's 'A Winter's Tale', king of Sicily, **3756.**
**Leopard** (*lĕp'ȧrd*), animal of the cat family, **1988–9;** family characteristics, **657–8;** fur, **1390;** in India, **1748.**
**'Leopard',** Brit. warship, **3670.**
**Leopard frog, 1373–4.**
**Leopardi** (*lā-ō-pär'dē*), **Giacomo, Count** (1798–1837). Ital. lyric poet, prose-writer, and scholar, master of finished style and slave of pessimism; 'La Ginestra' gives full expression to his creed.
**Leopard seal, 3166.**
**Le'opold I** (1157–94), duke of Austria, succeeded 1177; went on Crusades 1182 and 1190; quarreled with Richard I in Palestine; **3016.**
**Leopold I** (1790–1865), king of the Belgians, Ger. prince, uncle of Queen Victoria of England; elected 1831 to Belgian throne; able ruler, called "Nestor of Europe"; **376.**
**Leopold II** (1835–1909), king of the Belgians; succeeded 1865; notorious profligate, good business man, and able ruler; **376;** develops Congo State, **859–60, 3338, 40.**
**Leopold I** (1640–1705). Holy Roman emperor, elected 1658; defeated Turks and French; subdued Hungarian revolt and made Hungarian crown hereditary.
**Leopold II** (1747–92). Holy Roman emperor, elected 1790; son of Maria Theresa and brother of Marie Antoinette; died before events of Fr. Rev. called for intervention he had prepared.
**Leopoldville,** important town in s.w. Congo State on Congo R. near Stanley Pool; pop. 15,000; terminal of Matadi-Leopoldville R.R.; wireless station; **860.**
**Lepanto** (*lē-pän'tō*), **battle of** (1571), fought in Gulf of Corinth near Lepanto, Greece, **3559;** galleys, **2427;** Cervantes wounded, **682.**
**Lepidop'tera,** the order of scaly-winged insects, **1788, 3947;** includes butterflies and moths, **544–8.**
**Lep'idus, Marcus Aemilius** (d. 13 B.C.), wealthy Roman, triumvir with Antony and Octavian (Augustus), **258.**
**Lep'rosy,** a chronic disease of the skin and nerves for which no specific cure has been discovered; caused by bacteria, **1450;** former prevalence, **1614.**
**Lep'tis Mag'na** or **Ma'ior.** Anc. seaport in n. Africa, founded by Phoenicians; chief commercial entrepot for interior.
**Leptocar'dii,** a group of primitive animals, just below true vertebrates, **3947;** includes lancelets, **1271.**
**Le'pus,** the genus of hares and rabbits, **1584, 1585, 2951.**
**Lepus** or **Hare,** a constellation, *chart,* **873.**
**Le Puy** (*lẽ pwê*), France. Town 140 mi. n.w. of Marseilles; pop. 22,000; 12th cent. cathedral; famous in Middle Ages; lace, textiles, chocolate, spirits.
**Lerida** (*lā'rē-dȧ*), Spain. Walled cathedral city 80 mi. w. of Barcelona; pop. 25,000; as Celtiberian *Ilerda* heroically resisted Romans; leather, glass, textiles.
**Lérins** (*lā-răⁿ'*), **monastery of,** on small isl. of Lérins in Mediterranean 3 mi. from Cannes, France, **2299.**
**Ler'wick,** chief town of Shetland Isls., Scotland, on s.e. coast of mainland, **3206.**
**Le Sage** (*lẽ sȧzh'*), **Alain René** (1668–1747). Fr. novelist and dramatist, author of a hundred plays; a satiric realist ('Gil Blas', comic masterpiece of adventurous roguery).
**Les'bos.** Same as **Mytilene.**
**Les Chêneaux** (*lā shā-nō'*) **Islands,** in L. Huron, **2226.**
**Leschetizky** (*lĕsh-ĕ-tĭt'skĭ*), **Theodor** (1831–1915), Polish pianist and composer; teacher of Paderewski, **2625.**
**'Les Misérables'** (*lā mē-zā-rä'bl*), novel by Victor Hugo, **1694;** 'The Story of Jean Valjean', **1695–6.**
**Lesseps** (*lĕ-sĕps'*), **Ferdinand, Vicomte de** (1805–94), Fr. engineer; builds Suez Canal, **3384;** Panama disaster, **2652.**
**Lesser ant-eater,** *picture,* **146.**
**Lesser Antil'les,** isls. of W. Indies, **3718.**
**Les'sing, Gotthold Ephraim** (1729–81), Ger. critic and dramatist; helped free Ger. literature from Fr. influence; **1436;** chief works, **1438.**
**"L'état, c'est moi," 2065.**
**Leth'bridge,** Alberta. City 115 mi. s.e. of Calgary on Old Man (Belly) R.; pop. 12,000; distributing point for coal, lumber, farm products; various mfrs.; district headquarters for Royal Canadian Mounted Police.
**Lethe** (*lē'thē*), in Gk. myth., river of oblivion, **1558.**
**Le'to,** in Gk. myth., mother of Apollo and Artemis, **2510.**
**Letter writing, 1185.**
**Letts,** people of Latvia, **1969.**
**Lettuce** (*lĕt'ĭs*), **823;** when and how to plant, **1395, 1397.**
**Leucocytes** (*lū'kō-sīts*), white corpuscles in blood, **437.**
**Leuctra** (*lūk'trȧ*), Greece, village in Boeotia; battle of (371 B.C.), **3486, 1525,** *picture,* **3485.**
**Leuthen** (*loi'tĕn*), Germany, village in Lower Silesia, 9 mi. w. of Breslau; battle of (1757), **3180.**
**Leutze** (*loit'sĕ*), **Emanuel** (1816–68), Amer. painter of historical subjects, b. Germany, **2634.**
**Levant** (*lĕ-vănt'*) ("sunrise," i.e., "east"). Term applied to e. Mediterranean and its coastlands.
**Levant'ine Sea, 2194.**
**Levee',** an embankment, **3023;** Mississippi R. system, **2268, 2068, 2469;** natural, defined, **2791.**
**Level,** instrument used in surveying, **3398.**
**Levellers,** political faction in Puritan Civil War, **925.**
**Le'ver, Charles James** (1806–72). Irish novelist, born story-teller, with inexhaustible fund of boisterous extravaganza ('Charles O'Malley'; 'Harry Lorrequer').
**Lev'er,** a mechanical device, **2187, 2188;** Archimedes, **174.**
**Leverrier** (*lē-vêr-yā'*), **Urbain J. J.** (1811–77), Fr. astronomer; discovery of Neptune, **2818, 246, 247.**
**Le'vi.** Hebrew patriarch, 3d son of Jacob and Leah, ancestor of tribe of Levi or Levites.
**'Leviathan'** (*lĕ-vī'ă-thăn*), formerly *Vaterland,* an ocean liner, **3218.**
**Levis** (*lā-vē'*), Quebec. Important port and strongly fortified old town on St. Lawrence R. opposite Quebec city; pop. 10,500; large graving dock and shipyard.
**Le'vites,** tribe of Israelites, **1890.**
**Levit'icus.** The 3d book of the Old Testament, containing the ceremonial laws of the priests.
**Lev'ulose,** a sugar, **3388.**
**Lewes** (*lū'ĕs*), **George Henry** (1817–78), Eng. philosopher and critic; founded and edited *Fortnightly Review;* and George Eliot, **1134.**
**Lewes,** England, cap. of Sussex, 45 mi. s. of London; pop 11,000; battle of (1264), **2316.**
**Lewes River,** the upper course of the Yukon, **3835.**
**Lewis, Colonel Isaac N.** (born 1858), U.S. Army officer, retired; b. New Salem, Pa.; inventor of machine gun, **2097.**
**Lewis, Captain Meriwether** (1774–1809), Amer. explorer, b. near Charlottesville, Va.; captain U.S. Army and private sec. to Pres. Jefferson until sent by him on Lewis and Clark expedition; **1989–90.**
**Lewis, Sinclair** (born 1885). Amer. novelist, b. Sauk Center, Minn. ('Main Street'; 'Babbitt').
**Lewis, Major William B.** (1784–1866), friend of Andrew Jackson and member of famous Kitchen Cabinet, **1856.**
**Lewis and Clark Centennial Exposition,** also called American Pacific Exposition, held June 1 to Oct. 15, 1905, in Portland, Ore., to celebrate 100th anniversary of exploration of the Oregon country; cost about $7,000,000; attendance 2,545,509; **1990.**

**Lewis and Clark Expedition** (1804–06), **1989–90, 2274, 1727,** *map.* **3605.**
**Lewis Institute.** Co-ed. institution at Chicago, Ill.; founded 1896; engineering, domestic economy, science, liberal arts.
**Lewis machine gun, 2097–2101.**
**Lewiston,** Idaho. City on Snake and Clearwater rivers, 90 mi. s.e. of Spokane, Wash.; pop. 6574; mining, lumber, wheat, live stock, and fruit interests.
**Lewiston,** Me., mfg. city on Androscoggin R., 30 mi. n. of Portland; pop. 31,791; Bates College; **2128.**
**Lewistown,** Mont. City in center of state in farming, stock-raising, gold and coal mining, and oil dist.; pop. 6120.
**Lewis-with-Harris Island,** in Hebrides, **1625.**
**Lex Canuleia,** Rom. law, **3043.**
**Lex Hortensia,** Rom. law, **3044.**
**Lexington,** Ky., wholesale and mfg. center 73 mi. s. of Cincinnati, Ohio, in bluegrass region; pop. 41,543; famous horse market and race tracks; state univ. and Transylvania College; **1918.**
**Lexington,** Mass., town 11 mi. n.w. of Boston; pop. 6350; scene of first battle of Revolution; **1990.**
**Lexington,** Va., in farming dist. 30 mi. n.w. of Lynchburg; pop. 2870; Washington and Lee Univ., *picture,* **3649.**
**Lexington and Concord, battle of, 1990,** *picture,* **2169;** Revere's ride, **3000.**
**Lex Valeria,** Rom. law, **3042–3.**
**Leyden** or **Leiden** (*lī'dĕn*), Netherlands, famous old city on Old Rhine, 22 mi. s.w. of Amsterdam; pop. 62,000; birthplace of Rembrandt; **2441;** Dutch home of Pilgrims, **2176;** story, 'How the Ocean Saved Leyden from the Spaniards', **2443.**
**Leyden jar,** an electrical condenser; how invented, **1118;** oscillatory discharge, **1114.**
**Lhasa** (*lä'sä*) or **Lassa,** cap. of Tibet in s.; pop. 20,000; **3496.**
**Lhut, Daniel Greysolon, Sieur du** (d. 1709), Fr. explorer; skirts L. Superior, **1047.**
**Liakoura** (*lē-ä'kų-rä*), modern name for Mt. Parnassus, **1517.**
**Liao-ho** (*lē-ou-hō'*). River of Manchuria; rises in Great Khingan Mts., flows e. along Chihli border, then s. to Gulf of Liaotung.
**Liaotung** (*lē-ou-tųng'*), **Peninsula,** Manchuria, projects s.w. into Yellow Sea between gulfs of Liaotung and Korea; Port Arthur at tip; Japan gains, **3098.**
**Liaoyang** (*lē-ou-yäng'*). City in Manchuria on r.r. from Mukden to Port Arthur; pop. 40,000; captured by Japanese (1904) in Russo-Japanese War.
**Li'ard River,** Canada, rising in n. Brit. Columbia and flowing n.e. to Mackenzie, **2102.**
**Liassic** (*lī-ăs'ik*) **time,** in geology, *picture,* **1419.**
**Libau** (*lē'bou*), Latvia, Baltic port, r.r. terminus, and mfg. city; pop. 91,000; formerly Russian; ice-free artificial harbor; large export trade; shelled by Ger. fleet in World War; **1969.**
**Libby Prison,** famous Confederate prison at Richmond, Va., hastily established in Libby and Son's tobacco warehouse during Civil War; removed to World's Fair at Chicago 1892; site now marked by tablet; **781.**
**Liberal arts, 827–8, 832.**
**Liberal party** (Canada), **618, 620;** Laurier leads, **1971;** World War coalition, **466, 467.**
**Liberal party** (Gt. Brit.), **2869;** Gladstone, **1466, 1468, 2689–90;** Lloyd George, **2039–41, 3665;** policy in S. Africa, **3283;** Russell, **3083–4.**
**Liberal Republican party** (U.S.), formed 1872 by Republicans opposed to political abuses under Grant, **1539, 1499.**
**Liberal Unionist party** (Gt. Brit.), **2869, 1468.**
**'Liberator',** abolitionist paper published by Garrison, **1400.**
**Liberec.** *See in Index* **Reichenberg.**
**Libe'ria,** negro republic on w. coast of Africa; 43,000 sq. mi.; pop. 2,000,000; cap. Monrovia; **1990–1,** *map,* **40–1.**
**Liberty,** Burke on, **540;** Patrick Henry, **1638;** Napoleon, **1370.**
**'Liberty',** sloop belonging to John Hancock, **1570.**
**Liberty, Statue of,** in N.Y. harbor, **2487,** *picture,* **2488.**
**Liberty Bell, 976.**
**'Liberty, Equality, Fraternity', 1366.**
**'Liberty, Equality, and Humanity', 2178.**
**Liberty** or **Bedloe's Island, N.Y., 2487,** *map,* **2488.**
**Liberty loans** (U.S.), in World War, **3802.**
**Liberty motor, 60.**
**Liberty party** (U.S.), **2871.**
**Li'bra,** a sign of the zodiac, **3840.**
**Libraries, 1991–3;** Alexandrian, **88;** Assyrian at Nineveh, **298;** Bodleian, *pictures,* **2609, 2610;** Brit. Museum, **2056;** Boston Public, **471,** *picture,* **470;** Carnegie's contributions, **646;** in medieval monasteries, **2300;** New York Public, **2491;** Vatican, **3055.**
**Library of Congress,** Washington, **3682–3, 1992,** *pictures,* **1993, 3682;** murals, **911.**
**Libret'to,** text of opera, **2584.**
**Lib'ya** or **Libia.** *See in Index* **Tripoli.**
**Libyan Desert,** part of Sahara, s. of Tripoli and w. of Egypt, **3542,** *maps,* **40–1;** Fayum, **1093.**
**Lice.** *See in Index* **Louse.**
**License,** form of taxation, **3441;** liquor, **2920.**
**Licensing Act** (1637), **2918.**
**Lichens** (*lī'kĕns*), "partnership" plants composed of algae within fungi, **1994, 2680;** botanical classification, **3938;** eaten by reindeer, **2993;** as soil-makers, **3273;** yield litmus, **2031.**
**Lichfield,** England, city in Staffordshire, 118 mi. n.w. of London; pop. 9000; cathedral, **1160;** Dr. Johnson's birthplace, **1898.**
**Lichnowsky, Karl Max von, Prince** (born 1860). Ger. ambassador to Gt. Brit. 1912–14; his memorandum showing Ger. diplomatic responsibility for World War was made public without his authority in 1917 and created sensation.
**Licin'ian laws,** six laws of anc. Rome passed 367 B.C. in tribuneship of Gaius Licinius; practically ended the struggle between the patricians and plebeians; **3044.**
**Licin'ius, Flavius Galerius Valerius** (250?–324), Rom. emperor, defeated Maximinus and became sole ruler in East; married Constantine's half-sister; executed for treason; **870.**
**Lick, James** (1796–1876), Amer. philanthropist, b. Fredericksburg, Pa.; establishes observatory, **2552.**
**Licking River,** rises in Cumberland Mts. in e. Ky., and flows n.w. 220 mi. to Ohio R., **2573.**
**Lick Observatory,** Calif., **2552.**
**Licorice** (*lĭk'ō-ris*), a plant of the bean family, **1995.**
**Lid'dell, Henry George** (1811–98), dean of Christ Church 1855–91; with R. A. Scott prepared 'Greek Lexicon' (1843) still used by students everywhere; his daughter Alice, **647.**
**Lido** (*lē'dō*), Venice, **3624.**
**Lie** (*lē*), **Jonas** (1833–1908). Norwegian novelist, friend of Ibsen and Björnson; a realist who avoided excesses in his happy portrayal of contemporary sailors and peasants; master of humor, sympathy, psychological analysis ('The Visionary'; 'The Commodore's Daughter'; 'Niobe'; 'Dyre Rein').
**Lie, Jonas** (born 1880), Amer. painter, b. Norway, **2634.**
**Liebig** (*lē'biĸ*), **Justus von, Baron** (1803–73). Ger. chemist and teacher; established first laboratory course for teaching chemistry, proved that "organic" substances are subject to same chemical laws as inorganic ones and synthesized many organic compounds; proved animal heat the product of combustion of food; his studies of plant chemistry and fertilizers founded agricultural chemistry.
**Liebknecht** (*lēp'knĕĸt*), **Karl** (1871–1919). German Socialist leader; son of Wilhelm Liebknecht, friend of Marx and Engels; only member of Reichstag to oppose World War; shot by soldiers while on his way to prison after Spartacan uprising; **3310.**
**Liechtenstein** (*lēĸ'tĕn-shtīn*), principality of Europe, formerly practically Austrian dependency, but absolutely independent since 1918; pop. 11,000; has had no army since 1868; cattle, corn, wine, fruit, timber; area and location, **1194.**
**Liége** (*lē-āzh'*), chief mfg. city of Belgium; pop. 167,000; **1995, 374;** Charles the Bold takes, **697;** siege of August 1914, **1995, 3810, 634.**
**Liegnitz** (*lēg'nĭts*), Germany. Mfg. and trade town in Prussian province of Silesia, 40 mi. n.w. of Breslau; pop. 70,000; decisive victory of Frederick the Great over Austrians (1760).
**Lieutenant** (*lū-tĕn'ănt*), in U.S. Army, commissioned officer next in rank below a captain; in infantry organization, **218;** insignia, **3576.**
**Lieutenant,** in U.S. Navy, **2426;** insignia, **3577.**
**Lieutenant-Colonel,** in U.S. Army, officer ranking next below a colonel; in infantry organization, **218;** insignia, **3576.**
**Lieutenant-Commander,** in U.S. Navy, **2426;** insignia, **3577.**
**Lieutenant-General,** in U.S. Army, **218;** insignia, **3576.**
**Lieutenant Governor,** in Canada, **622.**
**Life, 393–9, 2820–31,** *Study Outline,* **3935–7;** chemistry of life processes, **394, 714, 3693–4, 1173, 2824, 1010–1;** earliest appearance on earth, **1418;** evolution of living forms, **1208–11;** heredity, **1641–4;** how transmitted, **394,** *picture,* **395;** length computed by insurance companies, **1792;** usual length in animals, **127,** *picture,* **126;** origin on earth, **1062;** on other planets, **2816, 2817, 396;** protoplasm the basis of, **2926.** *See also in Index* **Biology; Longevity.**
**Life Guards** (England), *picture,* **2050.**
**Life insurance, 1792.**
**Life saving** (how to rescue drowning person), **3412.**
**Life-saving service,** U.S., **1995–7;** under Treasury Dept., **3598.**
**Liffey** (*lĭf'ĭ*) **River,** Ireland, 70-mile long stream rising s. of Dublin and flowing w. and n. in a semicircle into Dublin Bay, **1807;** in Dublin, **1043,** *picture,* **1810.**
**Lig'ament,** connecting or binding tissue in the body, **3245.**
**Lig'gett, Hunter** (born 1857), lieut.-gen., U.S. Army; graduated U.S. Military Academy in 1879; served in Cuban and Philippine cam-

paigns; commanded First Army Corps, A.E.F., Jan.–Oct. 12, 1918, **3110**; commanded First Army, A.E.F., Oct.–Nov. 11, 1918, **194**; later he commanded Western Dept., U.S. Army; retired 1921.

**Light, 1997–2003**; actinism, **2778**; action in eye, **1213–4**, *pictures*, **1216**; affects conductivity of selenium, **2002–3, 3174**; amount produced by electric bulbs, **1124**; chemical action in photography, **2780, 2781, 2783**; color, **1998, 837**; deflected by gravity, **2000–1**; ether waves, **1998, 1180, 3706**; interference in soap bubbles, **3268**; limits of magnification, **2229**; mirage, **2260–1**; needed by plants, **2827–8, 1980–1, 394**; Newton's discoveries, **2478**; phosphorescence of animals, **2000, 2776, 1262–3, 2556**, *picture*, **2557**; polarized, **2000, 3438**; proved an electro-magnetic phenomenon by Maxwell and Hertz, **1122**; rays scattered by air, **52**; refraction, **2000, 1986–8**; spectrum and spectroscope, **3311–4, 2972**; studied in optics, **2786**; twilight and dawn, **3570**; velocity, **1997–8**. *See also in Index* **Lamps and lighting.**

**Light Brigade.** *See in Index* **Charge of the Light Brigade.**

**Lighthouses, Bureau of,** U.S., **2006, 3599.**

**Lighthouses and lightships, 2003–6**; anc. beacon, *picture*, **3455**; Pharos of Alexandria, *picture*, **3179**; Minot's Ledge, *picture*, **469**; ruined Rom. structure at Dover, **1027.**

**Lighting.** *See in Index* **Lamps and lighting.**

**Lightning, 2006–7**; electric nature, **1108, 2006**; fixes atmospheric nitrogen, **2511**; Franklin's experiments, **1118**; how it causes thunder, **3614.**

**Lightning bug,** a firefly, **1262–3.**

**Lightning rod,** for protecting buildings from lightning, **2007, 1118.**

**Lightship, 2004, 2006.**

**Light soil,** soil that is easily worked, **3273.**

**Light-year,** distance traveled by light in a year, **243.**

**Lignite** (*lĭg'nīt*), fuel midway between coal and peat, **812**; U.S. deposits, **3590, 2522, 2524, 3297.**

**Ligny** (*lēn-yē'*), village in Belgium 25 mi. s.e. of Brussels; victory of Napoleon over Prussians under Blücher (1815), prelude to battle of Waterloo, **3699.**

**Ligugé, monastery of, 2299.**

**Liguria** (*lĭ-gū'rĭ-ȧ*), in anc. Rom. days, that part of n. Italy which lay between the Po and the Mediterranean, and extended w. from the Gulf of Genoa to the Gaul border, or even at one time to the Rhone; also province of modern Italy; 2038 sq. mi.; pop. 1,300,000; **1840.**

**Ligu'rian Republic.** Name given to the Democratic govt. instituted in Genoa 1797 by Napoleon I; incorporated in France 1805.

**Ligur'ians,** a pre-Roman and pre-Tuscan people, organized in tribes, considered by some authorities the aboriginal inhabitants of n. Italy; in France, **1343.**

**Li Hung-Chang** (*lē hụng chäng*) (1823–1901), Chinese statesman; aided by Gordon's army, suppressed Taiping rebellion; bore chief burden of Chino-Japanese War; for many years "buffer" between China and outside world; **3498.**

**Li'lac,** shrub of the olive family, with clustered purplish or white flowers, **2008, 3426**: flower structure, **1305**; in hedges, **1628.**

**Liliaceae** (*lĭl-ĭ-ā'sĕ-ē*) or **Lily family,** plant family including lilies, tulips, and onions, **2009, 3939.**

**Lilia'les,** order including the lily, iris, and amaryllis families, **3939.**

**Lil'iencron, Detlev von, Baron** (1844–1909). Ger. soldier, lyric poet, and realistic novelist ('Adjutantenritte', poems; 'Poggfred', humorous epic; 'Unter flatternden Fahnen', 'Krieg und Frieden', volumes of short stories).

**Lil'ium,** the lily genus of plants, **2009.**

**Liliuokalani** (*lē-lē-u-ō-kä-lä'nē*) (1838–1917), queen of Hawaiian Isls. (1891–93); deposed; **1605, 791.**

**Lille** (*lēl*), mfg. city of n. France on Deule R.; pop. 220,000; **2008, 1348**; recovered by Allies, **3806.**

**Lilliputians** (*lĭl-ĭ-pū'shănz*), in Swift's 'Gulliver's Travels', tiny inhabitants of Lilliput, **3407–8.**

**Lilly "the Euphuist."** *See in Index* **Lyly.**

**Lily, 2008–9**; Bermuda or Easter lily, **386**, *pictures*, **1071, 1306**; poisonous types, **2854**; pollen grain, *picture*, **1309**; related to onion, **2581**; water-lilies, **3698–9**, *pictures*, **2828, 474.**

**Lilybaeun** (*lĭl-ĭ-bē'ŭm*). Anc. city on Lilybaeum Promontorium (Cape Boeo), w. extremity of Sicily, founded by Carthaginians; starting point of Romans on African military expeditions; modern Marsala; pop. 65,000; famous for wine.

**Lily of the valley, 2009.**

**Li'ma,** Ohio. Industrial city on Ottawa R., 70 mi. s. of Toledo, in natural gas and petroleum belt; pop. 41,326; cars, locomotives, motor trucks; ships oil, farm, and dairy products.

**Lima** (*lē'mä*), Peru, cap. of Peru; pop. 175,000; **2009, 2744**, *pictures*, **2743**; founded by Pizarro, **2814.**

**Lima bean, 347.**

**Liman von Sanders, Otto** (born 1855). Prussian general; in command of Turkish army which defeated allied attack on Gallipoli peninsula 1915; in 1918 in command of army in Palestine which was crushed by Gen. Allenby.

**Lim'burger cheese, 709.**

**Lime,** fruit of lime tree, **2011**; vitamin content, **2011, 3652.**

**Lime** or **quicklime,** calcium oxide (CaO), **2010, 571**; in calcimine, **2642**; chemical action in glass-making, **10**; obtained by burning shells, **3201**; in soils, **89, 3273.**

**Lime, slaked,** calcium hydroxide ($Ca(OH)_2$), **2010, 571.**

**Lime and sulphur wash,** an insecticide and fungicide, **3331.**

**Lime light, 2010.**

**Limequat,** a citrus fruit, **2011.**

**Lim'erick.** County of w. Ireland, in province of Munster; 1064 sq. mi.; pop. 145,000; includes most of Golden Vale, most fertile dist. in Ireland; chief river, Shannon.

**Limerick,** Ireland, at head of estuary of R. Shannon, most important port on w. coast; pop. 39,000; flour-milling, bacon-curing, lace-making; a county borough with its own county council; gives name to Limerick verse, **2010.**

**Limerick,** nonsense poem, **2010.**

**Limestone,** calcium carbonate ($CaCO_3$), **2010**; Bedford or Indiana, **1760**; Canada, **640**; cave formation, **666**; in cement, **674**; chalky forms, **685**; classed as sedimentary rock, **1417**; composition, **571**; corals secrete, **886**; in iron smelting, **1820**, *picture*, **1818**; marble a limestone, **2144**; principal material of shells, **3201**; quarrying, **2943–5**, *picture*, **1761**; why water dissolves it, **571**; yields lime, **2010.**

**Lime tree,** citrus tree yielding a small green fruit, **2011**; introduced into Europe, **932**; name given to European linden, **2018.**

**Lime water,** solution of slaked lime in water, **2010.**

**Limicolae** (*lī-mĭk'ō-lē*), the shorebird order, **412**, *picture*, **414**; includes plover, **2838–9**; snipe, sandpipers, and curlews, **3261.**

**Limitations, Statutes of.** Laws in England and U.S. by which right of bringing action is limited to a fixed period after occurrence of events giving rise to cause of action.

**Limmat** (*lĭm'mät*), river of Switzerland; rises at n. end of L. Zurich, flows n.w. 18 mi. to Aar R.; upper course called Linth; **3842.**

**Limoges** (*lē-mōzh'*), town in w.-cent. France on R. Vienne; pop. 92,000; taken by Black Prince 1370; porcelain-mfg. center, **1348**; enameling, **1146.**

**Limon** (*lē-mōn'*), chief seaport of Costa Rica, on a bay of the Caribbean; founded 1871; almost entire coffee and banana crops of Costa Rica exported from here; railroad, **896.**

**Limon Bay,** Panama, **2662.**

**Limonite** (*lī'mō-nīt*), a yellowish iron ore (iron hydroxide), **1817.**

**Lim'pet,** a gastropod mollusk which clings to rocks, **2281, 3945**; homing instinct, **130.**

**Limpopo** (*lĭm-pō'pō*) or **Crocodile River,** in e. part of S. Africa; rises near Pretoria, forms n. boundary of Transvaal, then flows s.e. through Port. E. Africa 1000 mi. into Indian Ocean; **3526, 3282; 1069.**

**Lincoln, Abraham** (1809–65), 16th president of U.S., **2011–7**; anecdotes, **2016–7, 555**; biographies of, **2016**; debates with Douglas, **2017–8**; early life, **2011–2, 967, 2028, 1731**; effects of election (1860), **2012, 522, 777, 857**; Lowell's tribute to, **2017**; memorial, **3684**, *picture*, **2011**; opposes Mexican War, **2872**; quoted, **1394, 3601**; relations with Seward, **3182**; relations with Stanton, **3339**; statue by Borglum, **2448**; statue by Saint-Gaudens, **3107**, *picture*, **3161**. —*Administrations*, **2012, 2014, 776–81**; C. F. Adams minister to England, **12**; offers Lee command of U.S. forces, **1984**; and McClellan, **2094, 2095**; and *Trent* affair, **3539**; supports Grant, **3207, 1498**; issues Emancipation Proclamation, **1139–40**; W.Va. admitted, **3723**; fall of Vicksburg, **3637**; Gettysburg Address, **1454, 2014**; Nevada admitted, **2446**; reëlection, **2014, 2095**; reconstruction policy, **780**; assassination, **2014.** *See also in Index* **Civil War.**

**Lincoln,** England, cap. of Lincolnshire, on Witham R. 125 mi. n.w. of London; pop. 63,000; Rom. remains; live stock market, iron mfrs.; cathedral, **1160**, *picture*, **1161.**

**Lincoln,** Ill. Industrial city 28 mi. n.e. of Springfield in agricultural and coal-mining region; pop. 11,882; varied mfrs.; named for Abraham Lincoln and contains courthouse where he practiced as a lawyer.

**Lincoln,** Neb., state cap. in s.e.; pop. 54,948; distributing point for large farming dist.; **2432**; new capitol, *picture*, **2431**; state univ., *picture*, **2431.**

**Lincoln City,** Ind., Lincoln's early home, **2011.**

**Lincoln College,** Oxford, founded, **2610.**

**Lincoln-Douglas debates, 2017–8, 2012, 1027.**

**Lincoln Farm Association,** memorial museum, **2014.**

**Lincoln Highway, 3026.**

**Lincoln sheep, 3200**, *picture*, **49.**

**Lincolnshire.** Agricultural county in e. England; 2646 sq. mi.; pop. 593,000.

**Lind, Jenny** (1820–87). The "Swedish nightingale," famous and beloved soprano singer; toured U.S. 1850–52 under management of P. T. Barnum; married her accompanist, Otto Goldschmidt.
**Linden,** or basswood, a shade tree, **2018;** classified, **3533;** often called lime tree in Europe, **2011.**
**Lindsay, (Nicholas) Vachel** (born 1879). Amer. author and lecturer, b. Springfield, Ill. ('A Handy Guide for Beggars'; 'The Chinese Nightingale'; 'The Congo'); in summer of 1912 he wandered through the country on foot like a modern troubadour, reciting and selling his verses for food and lodging.
**Lindsay,** Ontario. Port on Scugog R. about 60 mi. n.e. of Toronto; pop. 8000; govt. arsenal, munitions plant, sawmills, foundries.
**Lindsey, Ben B.** (born 1869), Amer. social reformer, b. Jackson, Tenn.; long judge Juvenile Court of Denver, established through his efforts; **1906.**
**Line,** in geometry, **1422–8.**
**Line engraving, 1168.**
**Linen, 2018, 1291–2;** Belfast manufactures, **371;** bleaching agents, **435;** thread, **3493.**
**Line of force,** imaginary line along which magnetic force is exerted between two points of opposite magnetism; shown by iron filings, *picture,* **2123;** constitute magnetic field, *pictures,* **1051.**
**Ling,** or heather, **1621.**
**Link,** unit of length in surveying (7.92 inches), **3398.**
**Linné** (*lĭ-nā'*), or **Linnae'us, Carl von** (1707–78), Swedish botanist and naturalist, **2018;** founds systematic classification of animals, **3841,** of plants, **473.**
**Lin'net.** Bird of finch family, named because it feeds on linseed and hemp; N. Amer. linnet or redpoll nests in extreme n. and migrates in winter as far south as Ohio Valley; plumage varies greatly in color according to season.
**Lino'leum and oilcloth, 2018.**
**Li'notype, 2019–23, 2472,** *picture.* **2473.**
**Linseed** (flaxseed) **oil, 1291, 1227;** in ink, **1780;** in linoleum, **2018;** in paints, **2642.**
**Linsey-woolsey,** a cloth, **2018.**
**Lint, cotton, 902.**
**Linters,** fibers from cottonseed, **906.**
**Linz** (*lĭnts*), Austria. Danube R. port, 90 mi. w. of Vienna; pop. 95,000; cap. of province of Upper Austria; large trade by rail and river; makes tobacco products, farm implements, boats, cloth.
**Lion, 2024–5;** in Africa, **34, 41;** altitude range, *picture,* **397;** belongs to cat family, **658;** distinguished from tiger, **3499;** evolutionary position, *diagram,* **128;** in heraldry, **1639;** in India, **1748;** length of life, **126;** story, 'Androcles and the Lion', **2025.**
**Lion** or **Leo,** a constellation; as sign of the zodiac, **3840.**
**Lion, Gulf of the,** wide bay of Mediterranean washing most of s. coast of France, **1344.**
**'Lion of Lucerne',** sculpture by Thorwaldsen, **3158.**
**"Lion of the North," 698.**
**Lions, Court of,** in Alhambra, *picture,* **3298.**
**Lipari** (*lĭp'à-rĭ*) or **Aeolian Islands,** Italy, group of volcanic isls. in Mediterranean n. of Sicily; 45 sq. mi.; pop. 20,000; largest Lipari; fruit, olives, pumice stone, alum, sulphur, nitre; volcanoes, **1971–2, 2194.**
**Lippe** (*lĭp'ē*). Republic in w. Germany, formerly principality; 469 sq. mi.; pop. 155,000; cap. Detmold; forests, in which beech predominates, cover 130 sq. mi.
**Lippi,** (*lĭp'pē*), **Fra Filippino** (1460–1505). Florentine painter, son of Fra Filippo Lippi and pupil of Botticelli; his work is more ornamental than his father's, more realistic and less poetical than Botticelli's; first Florentine to introduce details of antique costume.
**Lippi, Fra Filippo** (1406–69), Florentine painter, probably the greatest colorist of his day; his pictures reveal a strong, naïve nature, with a lively and somewhat whimsical observation; **2629, 2108.**
**Lip-reading,** aid to deaf, **970, 1916.**
**Lip'ton, Sir Thomas** (born 1850), Eng. merchant and yachtsman, best known in U.S. as challenger for the *America's* Cup, **444–5.**
**Liquefied gases,** gases reduced to liquids by chilling under pressure, **2025, 1618, 1403;** acetylene, **9;** air, **2025;** helium, **1629;** hydrogen, **1710;** in warfare, **1408.**
**Liquid,** a substance in the fluid state; Archimedes' principle, **682;** capillarity, **641;** determining density, **1711;** dew formation, **1000;** distillation, **1014;** electrolysis, **1125;** evaporation, **1207;** freezing, **1361–2, 1720, 3696;** hydraulics, **1710;** incompressibility, **1708, 1710;** latent heat, **3696;** osmosis, **2825;** siphon, **3243;** surface tension, **3267–8;** unique properties of water, **3693–4;** waves, **3705–6, 3276.**
**Liquid air, 2025.**
**Liquidambar.** Same as **Sweet-gum.**
**Liquid fire,** in World War, **3791.**
**Liquid measure, 3715.**
**Liquorice.** Same as **Licorice.**
**Liquor laws:** excises in U.S., **3441;** Göteborg (Gothenburg) system in Sweden, **3404;** Iceland, **1724;** prohibition, **2920–1, 3465;** work of W.C.T.U., **3777.**
**Liquors, distilled, 84.**
**Lis'bon,** cap. of Portugal; pop. 440,000; **2026,** *picture,* **2890;** earthquake, **1066, 1065;** university, **2889.**
**Lisle** (*līl*), a hard twisted thread originally of linen, now often of specially prepared cotton; origin of name, **2008.**
**Lis'ter, Joseph, Baron** (1827–1912), Eng. surgeon; discovered antiseptic methods of surgery, **150, 1687, 1799.**
**Lists,** in medieval tournament, **1934.**
**Liszt** (*list*), **Franz** (1811–86), Hungarian composer, **2026–7;** compositions, **2381;** home in Weimar, **3716.**
**Litchfield,** Conn., village 23 mi. w. of Hartford; pop. 707; first temperance society, **3465.**
**Liter** (*lē'tēr*), unit in metric system (1.0567 liquid qts.), **2206.**
**Lit'erature:** *Study Outline,* **4001–3;** academies, **4;** American literature, **111–7;** Arabian, **168–72;** Australian, **268;** Bible as, **338;** books, how to choose and read, **2979–82;** Canadian, **623–5;** children's, **2027–30, 3367–8;** drama, **1031–9;** Egyptian, **1100, 1102;** English, **1163–8;** essay, **1177–8;** French, **1363–6;** German **1435–8;** Greek, **1534–8;** Hebrew, **1624–5;** Hindu, **1755–6;** Icelandic, **1724;** Irish, **1814, 674;** Italian, **1832–3;** Latin, **1966–8;** mythology in, **2386;** novel, **2539–42;** Persian, **2738;** poetry, **2850–1;** Portuguese, **2889;** romance, **3039–40;** Renaissance, **2995–7;** Russian, **3096–8;** Scandinavian, **3134;** Spanish, **3307–8.** *See also in Index* chief topics above and individual writers by name.
**Literature for children, 2027–30, 3367–8.**
**Lith'arge,** lead monoxide, **1973.**
**Lithog'raphy, 2030, 1170;** "off-set" method, **1172.**
**Lith'opone,** a paint, **2642–3.**
**Lith'osphere, 3862.**
**Lithuania** (*lĭth-yụ-ā'nĭ-à*), republic on Baltic Sea; 19,000 sq. mi.; pop. 2,500,000; cap. Vilna; **2030,** *maps,* **2858, 1196–7;** people, **1969;** products and resources, **2030;** united to Poland, **2859;** woman suffrage, **3779.**
**Lit'mus, 2030–1;** test for acids, bases, and salts, **10.**
**Litterae humaniores** (*lĭt'ĕ-rē hū-măn-ĭ-ō'rēz*), **2996.**
**Little Bear** or **Ursa Minor,** a constellation, *chart,* **873;** Gk. legend, **872.**
**Little Belt,** strait between Fünen Isl. and mainland of Denmark; Swedish army under Charles X marched across it on ice to Fünen in 1658; **321, 996,** *map,* **997.**
**'Little Belt',** Brit. sloop, **3670.**
**Little Big Horn River,** in s. Mont., flows in northerly direction across Crow Indian Reservation for course of 60 mi. and enters Big Horn R.; scene of Custer massacre, **2312, 1773.**
**"Little Bo-Peep,"** origin, **2340.**
**"Little Corporal," 2393.**
**Little Crow** (1810–63), Sioux Indian chief, **2257.**
**Little Dog** or **Canis minor,** a constellation, *charts,* **873, 3343.**
**Little Falls,** N.Y. Mfg. city on Mohawk R. and Barge Canal 20 mi. s.e. of Utica; cascades in river give excellent water-power; pop. 13,029; knit goods, dairy products, bicycles, machinery, felt shoes, etc.; destroyed by Indians and Tories in 1782, resettled in 1790; Gen. Herkimer's grave near by.
**'Little Jack Horner',** origin, **2340.**
**Little John,** follower of Robin Hood, **3029;** story, 'How Little John Got His Name', **3029–30.**
**Little Kanawha River.** *See in Index* **Kanawha.**
**"Little Magician," 3616.**
**Little Miami River,** tributary of Ohio R.; 140 mi. long; *map,* **2568.**
**Little Missouri River.** Tributary of the Missouri, rising in Wyoming and flowing 450 mi. through Montana and N. and S. Dakota.
**"Little Mother Volga," 3660.**
**Little Mountain State, 3720.**
**Little-neck clam, 783.**
**'Little Red Riding-Hood', 1318.**
**"Little Rhody," 3347.**
**Little Rock,** Ark., cap. and largest city, on Arkansas R.; pop. 65,142; business in cotton and by-products; aeronautic warehouse; Camp Pike near by; **207, 208;** capitol, *picture,* **209.**
**Little Russia.** *See in Index* **Ukraine.**
**Little Sisters of the Poor,** founded in France 1840, extended to U.S. 1868; for relief and nursing of the aged, and infirm poor; vows, **2302.**
**Little Talks on Great Things,** by Arthur Mee: Ambition, **107–C;** Chivalry, **753–4;** Courage, **907–8;** Emotions, **1144;** Faith, **1221–2;** Friendship, **1371;** Good Manners, **1182;** Honesty, **1677;** The Honor of the Playing Field, **253;** Humility, **1697;** Imagination, **1737;** Keeping Our Word, **1915;** Marriage, **2152–3;** Obedience, **2550;** Optimism, **2586–7;** Patriotism, **2696–7;** Purity, **2938;** Reading, **2981–2;** Slander, **3247;** The Value of Time, **3503.**
**"Little theaters," 3485, 1036.**
**'Little Women',** book by Louisa M. Alcott, **84, 85.**
**Liukiu** (*lū'kū*) **Islands.** Same as **Nansei Islands.**
**Live oak, 2547, 2548, 1295.**
**Liver,** in human body, **2031;** largest gland, **1469;** how it works, *picture,* **2795.**
**Livermore, Mary Rice** (1821–1905). Amer. reformer, early advocate of abolition of slavery, prohibition,

and woman's suffrage; first won national reputation during Civil War as worker for Sanitary Commission.

**Liv'erpool,** England, 2d scaport of Brit. Empire and leading port of Gt. Brit. for export trade; on estuary of Mersey R.; pop. 775,000; **2031–2, 1158, 1578;** world's greatest wheat market, **3732.**

**Liverpool Mts.** Range in e. of New South Wales, Australia; highest point 4500 ft.

**Liverpool Port Authority, 2031, 2032.**

**Liverworts, 2032.**

**Live stock:** cattle, **662–3;** hogs, **1670–1;** horses, **1682–5;** loco weed effect, **3712–3;** oil-cake, **1227, 890, 902, 1291, 3297;** sheep, **3198–3200;** silage, **3240;** worm parasites, **3813.** —*Breeding*, **48,** *picture*, **49;** cattle, **663, 950, 1642;** horses, **1684–5;** laws of heredity, **1642.** *See also in Index* **Cattle; Dairying; Forage crops; Hog; etc.;** also various countries and states by name.

**Livingston, Edward** (1764–1836), Amer. statesman and jurist, b. Clermont, N.Y.; served successively as congressman, senator, sec. of state under Jackson, and minister to France; compiled Louisiana Code, **2071.**

**Livingston, Robert R.** (1746–1813), Amer. statesman, b. New York City; brother of Edward Livingston; first chancellor N.Y. state 1777–1801; minister to France 1801–05; aids Fulton's steamboat project, **1381;** and Declaration of Independence, **975;** negotiates Louisiana Purchase, **2073.**

**Livingston,** Mont. City on Yellowstone R., 45 mi. n. of Yellowstone Park, in mining and agricultural region; pop. 6311; r.r. machine shops; hunting and fishing resort.

**Livingstone, David** (1813–73), great missionary explorer of Africa, **2033–5, 38;** Congo exploration, **859;** discovers Victoria Falls, **3640;** Stanley's search for, **3338–9.**

**Livingstone Mts.** Range in Tanganyika Territory bordering n.e. shores of L. Nyasa; highest point 9600 ft.

**Liv'ius Andronicus** (*ăn-drō-nī'kŭs*) (3d cent. B.C.), first Rom. poet, **1966.**

**Livo'nia,** dist. in s. Esthonia and n. Latvia; a former Baltic province of Russia with cap. at Riga; 17,574 sq. mi.; **1969.**

**Livorno** (*lē-vôr'nō*). Same as **Leghorn.**

**Livy** (*lĭv'ĭ*), anglicized name of Titus Livius (59 B.C.–17 A.D.), Rom. historian, great prose writer of Augustan Age; 35 of the 142 books of his history of Rome still exist; **1967.**

**Liz'ard, The** or **Lizard Head.** A bold promontory of Cornwall; the most southerly point of Gt. Brit.

**Lizards,** scaly-bodied, four-legged reptiles, **2035–8, 2997,** *picture*, **1028;** chameleons, **685–6;** evolutionary position, *diagram*, **128;** foot, *pictures*, **1323;** of Galapagos Isls., **1729;** horned toad, **3507;** iguanas, **1729;** prehistoric, **134;** salamanders not lizards, **3112;** scales made of horn, **1680;** varied reproduction, **1090;** venerated in Egypt, **1106.**

**Ljubljana** (*lyu̯b-lē-ä'nä*). Same as **Laibach.**

**Ljusne** (*lyu̯s'nä*) **River,** Sweden, stream flowing 220 mi. s.e. into Gulf of Bothnia, *map*, **2531.**

**Llama** (*lä'mȧ*), S. Amer. animal of camel family, **2039;** altitude range, *picture*, **397.**

**Llaneros** (*lyä-nä'rōs*), cattlemen of Venezuela, **3620.**

**Llano Estacado** (*lyä'nō ĕs-tä-kä'dō*), or Staked Plain, extensive arid plateau in n.w. Tex. and s.e. N.M.; over 40,000 sq. mi.; **3474, 2464.**

**Llanos, 2790;** in Colombia, **836;** Venezuela, **3620.**

**Llobrégat** (*lyō-brā-gät'*) **River,** Spain, short river entering Mediterranean at Barcelona, **330.**

**Lloyd George, David** (born 1863), Brit. statesman, prime minister 1916–22, **2039–41;** budget of 1908, **2039–40, 3441;** Irish policy, **1811;** at Peace Conference, **3808.**

**Lloyd's, 1792.**

**Loam, 3273.**

**Loanda** (*lō-än'dä*) (São Paulo de Loanda). Cap. and chief seaport of Angola; pop. 25,500; former center of slave trade.

**Loango** (*lō-än'gō*). Port of Fr. Equatorial Africa, 100 mi. n. of mouth of Congo R.

**Loans, 327, 328, 528, 917–8.**

**Lobbying.** Term applied in U.S. to activities of interested parties in influencing legislation; so called from use of lobbies of legislative halls for conferences with members.

**Lobe,** of lungs, *picture*, **2083.**

**Lobe'lia,** a genus of plants of the family *Campanulacĕae*, having red, white, or blue flowers with very irregular corolla; *Lobelia inflata*, "Indian tobacco," is used in medicine; includes cardinal flower, **643.**

**Loblolly pine, 2808.**

**Lob Nor,** shallow lake in Gobi Desert, **228,** *map*, **740.**

**Lobster, 2041–2;** an arthropod, **127; 3325;** compared with crabs, **912.**

**Lobster pot, 2042.**

**Local option, 2920.**

**Local time, 3500.**

**Lochinvar** (*lŏĸ-ĭn-vär'*). Hero of Scott's ballad 'Young Lochinvar', "so faithful in love and so dauntless in war."

**Lochy, Loch,** w. Scotland, **3146.**

**Locke, David R.** Amer. humorist. *See in Index* **Nasby, Petroleum V.**

**Locke, John** (1632–1704), Eng. philosopher and political economist; author of 'Essay Concerning the Human Understanding', an epoch-making work, maintaining, against the doctrine of innate ideas, that experience is the source of all ideas; influence, **1165;** draws constitution for Carolina, **3292.**

**Locke, William John** (born 1863), Eng. novelist and playwright ('The Morals of Marcus Ordeyne'; 'The Beloved Vagabond'); **2541.**

**Lockhart, John Gibson** (1794–1854). Scotch writer, author of masterly biographies of Burns, Napoleon, and Scott.

**Lockjaw,** or tetanus, **151, 152, 1450.**

**Lock-out.** Closing of factories by employers to coerce workers.

**Lockport,** N.Y. City on N.Y. Barge Canal, named for two large locks situated there; pop. 21,308; grain and fruit trade; automobile parts, paper, machinery, glass, flour, steel, wallboard.

**Locks,** canal, **626;** of Erie Canal, *picture*, **625;** how they work, *picture*, **2660–1;** hydraulic lift lock on Trent Canal, *picture*, **2583;** Panama Canal, *pictures*, **2654–62.** *See also in Index* **Canals.**

**Locks and keys, 2042–3.**

**Lock stitch, 3187.**

**Lockwood, Belva Ann Bennett** (1830–1917). Amer. lawyer and reformer; first woman permitted to practice before U.S. Supreme Court; active in woman suffrage movement; nominated for president of U.S. 1884 and 1888 by Equal Rights party.

**Loco Focos,** U.S. political faction, **2871.**

**Locomo'tive, electric, 2968,** *pictures*, **2968, 2969.**

**Locomotive, pneumatic, 2847.**

**Locomotive, steam, 2043–4, 3348–52, 2962–3,** *pictures*, **2962–9;** early types, *pictures*, **275, 2044, 2963, 3525;** inventions of George Stephenson, **3353.**

**Loco weed, 3712–3.**

**Lo'cust,** an insect, **1504–6, 2045;** foot, *picture*, **1323;** length of life, **126;** immense numbers, **1781;** metamorphosis, **1786;** "17-year" (cicada), **764–5.**

**Locust,** a rough-barked tree of the bean family, **2045;** called false acacia, **4;** classified, **3533.**

**Locust, honey,** a tree of the bean family, **2045, 3535, 2201, 1627.**

**Lode mining, 1479, 1480.**

**Lode'stone,** a natural magnet, **2122;** used in compass, **854.**

**Lodge, Henry Cabot** (born 1850). Amer. political leader and historian, b. Boston; senator from Mass. since 1893 ('The Story of the Revolution'; 'Life of Alexander Hamilton'; 'Life of George Washington').

**Lodge, Sir Oliver Joseph** (born 1851), Eng. physicist, exponent of psychic research, and author ('The Ether of Space'; 'Raymond, or Life and Death'); definition of physics, **2787.**

**Lodi** (*lō'dē*), Italy, town 18 mi. s.e. of Milan; pop. 23,000; scene of Fr. victory over Austrians (1796); Napoleon at, **2393.**

**Lodz** (*lōdz*), Polish city 75 mi. s.w. of Warsaw; pop. 400,000; enormous recent growth due to large textile industry; **2857.**

**Loeb, Jacques** (born 1859), Ger.-Amer. biologist; fertilized sea-urchin eggs chemically ("artificial parthenogenesis"); developed theory that many so-called "intelligent" actions of animals are physical or chemical in nature ("tropisms"), **131.**

**Loess** (*lŭs*), a type of soil, **3273; in** China, **3750, 749.**

**Lofo'ten** or **Lofoden Islands,** group of rocky isls. off n.w. coast of Norway; 1560 sq. mi.; **2532.**

**Log, ship's,** device for measuring speed, **2045, 2420,** *picture*, **2046.**

**Lo'gan, George** (1753–1821). Amer. statesman, b. Stenton, Pa. (now a part of Philadelphia); U.S. senator from Pa. 1801–07; his attempt to settle difficulties between France and U.S. (1798) without authority from the govt. led Congress to pass Logan Act, forbidding such activities by non-accredited persons.

**Logan, James** (1674–1751). Amer. colonial politician, b. Ireland; a Quaker and secretary to William Penn; chief justice of Supreme Court of Pa. 1731–39; bequeathed more than 2000 volumes to Philadelphia Library.

**Logan, John** (1725?–80). Eng. name of Cayuga Indian chief, Tahgahjute; friend of whites until massacre of his family by whites 1774; leader in Dunmore's War.

**Logan, John Alexander** (1826–86). Amer. Civil War general and U.S. senator, b. Jackson County, Ill.; candidate for presidential nomination on Republican ticket 1884; originated Memorial or Decoration Day, when commander-in-chief of the Grand Army of the Republic; author 'The Great Conspiracy', dealing with Civil War; statue by Saint-Gaudens, **3107.**

**Logan,** Utah. City on Logan R. 70 mi. n. of Salt Lake City; pop. 9439; makes beet sugar, condensed milk, knit goods, flour, candy, etc.; fish hatchery near by; Utah Agricultural College, Brigham Young College.

**Logan, Mt.,** 2d highest peak (19,539 ft.) of N. Amer., in s.w. corner of Yukon Territory, **77.**

**Loganberry, 2046.**

**Logansport,** Ind. Industrial and r.r. center 70 mi. n. of Indianapolis on Wabash and Eel rivers; pop. 21,626; trade in lumber and agricultural products, r.r. shops, and numerous mfrs.
**Log'arithms, 2174.**
**Log book, 2046.**
**"Log-cabin campaign," 1594.**
**Loggerhead shrike, 3225,** *picture,* **419.**
**Loggia dei Lanzi** (*lō'jä dā'ē länd'zē*), gallery in Florence, **1849.**
**Logic, 2773;** mathematics a form of, **2174.**
**"Log-rolling,"** frontier custom, **1759.**
**Logroño** (*lō-grō'nyō*), Spain. Anc. walled city in n., cap. of province of Logroño, on R. Ebro; pop. 24,000; wine trade.
**Logue** (*lōg*), **Michael** (born 1840). Rom. Cath. cardinal, primate of all Ireland; first Irish primate to be made a cardinal.
**Logwood, 2046–7;** as a dye, **1050;** in ink, **1779.**
**Lohengrin** (*lō'ĕn-grĭn*), in Ger. legend, a knight of King Arthur's court, **2047;** opera by Wagner, **2584.**
**Loire** (*lwär*), longest river in France (645 mi.), **2047, 1345.**
**Loki** (*lō'kē*), in Norse myth., mischief-making god, **306, 2504, 3135–6.**
**Lolach,** a S. Amer. lung-fish, **2363, 2364, 2365.**
**Lol'lards,** followers of Wyclif, **3817.**
**Lom'bard College.** At Galesburg, Ill.; founded 1851; co-ed.; liberal arts, social science, philosophy, science, music.
**Lombard League,** defeats Frederick I, **1358.**
**Lombards,** Germanic tribe which settled in n. Italy, **2047;** invade Italy, **1194, 1195;** and Gregory I, **1541;** Charlemagne conquers, **689, 1842.**
**Lombard Street,** London, origin of name, **2047, 2051.**
**Lombardy,** a division of n. Italy, **2047,** *map,* **1836;** agriculture, **1190, 1838–9;** history, **1837;** mfrs., **1840;** Po R., **2848.**
**Lombardy, iron crown of, 2047.**
**Lombardy poplar, 2880.**
**Lombok',** isl. of Dutch E. Indies, e. of Java; 3136 sq. mi.; exports rice, coffee, indigo, sugar; Australasian fauna, **1072, 404.**
**Lombroso** (*lŏm-brō'sō*), **Cesare** (1836–1909). Famous Ital. criminologist, founder of science of criminal anthropology, originator of theory that there is a "criminal type" marked by physical signs ('The Criminal').
**Lo'mond, Loch,** largest and most beautiful lake in Scotland, in counties of Stirling and Dumbarton; 27 sq. mi.; length 23 mi.; **3146.**
**Lomonosof** (*lŏm-ô-nō'sŏf*), **Michael Vasilievitch** (1711–65), Rus. poet and philologist; established basic principle of latter-day Russian language ('Ode on the Capture of Khotin'); **3097, 3098,** *picture,* **3096.**
**London, Jack** (1876–1916). Amer. novelist, whose stories are largely drawn from his own adventurous career as sailor, tramp, stevedore, gold hunter, and war correspondent ('The Call of the Wild'; 'People of the Abyss'; etc.).
**London,** England, world's largest city, cap. of United Kingdom; pop. over 7,000,000; **2048–56;** British Museum, **1198, 1200, 2056, 1992,** *pictures,* **1206, 1525;** docks, **1578, 2051;** fogs, **1316;** government, **2056;** Parliament buildings, **2054, 2687,** *picture,* **2049;** police, **2865;** St. Paul's Cathedral, **2052,** *pictures.* **2048, 2051;** stock exchange, **3359, 3360;** Thames, **2051, 3432;** Thames Embankment, **2053;** Tower, **2048–51,** *picture,* **2056;** Tower Bridge, **506,** *picture,* **507;** waterworks in early times, **3702;** Westminster Abbey, **3718–9, 2054,** *pictures,* **2049, 3719.**—*History,* **2056,** origin, **2050–1;** charter granted, *picture,* **3740;** Wat Tyler's rebellion, **3571;** Jack Cade's rebellion, **1634;** great fire, **2056, 1262, 694.**
**London,** Ontario, commercial center of w. Ontario, on Thames R.; pop. 60,000; **2057.**
**London, Treaty of** (1913), in Balkan War of 1912–13, **310.**
**London, Treaty of** (1915), the secret agreement by which the Allies persuaded Italy to enter World War, **3795.**
**London Company,** corporation chartered 1606 for purpose of planting colonies in America; grant to Pilgrims, **2176;** Jamestown colony, **1861.**
**Lon'donderry,** 2d **Marquis of.** *See in Index* **Castlereagh.**
**Londonderry** or **Derry,** Ireland. Port on Foyle R. 95 mi. n.w. of Belfast; pop. 41,000; linen mfrs.; besieged by James II in 1689; chief town of county of Londonderry, Ulster (816 sq. mi.; pop. 141,000).
**Lone Star State, 3473.**
**Long, Crawford W.** (1815–78), Amer. physician and surgeon, b. Danielsville, Ga.; pioneer in use of ether, **124.**
**Long, John Davis** (1838–1915). Amer. public official, b. Buckfield, Me.; gov. of Mass. 1880–83; member of Congress 1883–89; sec. of navy 1897–1902, during Span.-Amer. War.
**Long, John Luther** (born 1861). Amer. novelist and dramatist, b. Pa. ('Madame Butterfly'; 'The Darling of the Gods').
**Long Beach,** Calif. Seaside resort and industrial center on s. coast about 20 mi. s. of Los Angeles; resident pop. 55,593; chief industry shipbuilding.
**Longbow,** in Hundred Years' War, **1699, 1700;** influence on warfare, **214, 1935;** Robin Hood's skill, **3028, 3032,** *picture,* **3031.**
**Long Branch,** N.J., famous seaside resort on Atlantic coast 30 mi. s. of New York City; resident pop. 13,521; summer visitors number 50,000; **2458.**
**Longchamps** or **Longchamp** (*lôn-shän'*), race-course w. of Paris, **2682.**
**Long distance telephone, 3460.**
**Long'erons,** part of airplane, **65.**
**Longev'ity,** length of life; of animals, **127,** *pictures,* **126;** cicada, **764–5;** connected with rate of reproduction, **127;** plants, **2830;** sequoias the oldest living organisms, **3175–6, 3530;** trees, **3533, 2830.**
**Long'fellow, Henry Wadsworth** (1807–82), Amer. poet, **2057, 113,** *pictures,* **2058, 113;** bust in Westminster Abbey, **3719;** Cambridge home, **588;** Portland associations, **2128;** 'The Story of Hiawatha', **2059–61;** quoted, **1814, 1963, 2538, 3490, 3770.**
**Longinus** (*lŏn-jī'nŭs*), **Cassius** (213?–273 A.D.), Gk. critic, **1538.**
**Longipen'nes,** order of long-winged sea birds, **412, 1550,** *pictures,* **413.**
**Long Island,** N.Y., isl. s. of Conn. forming s.e. portion of N.Y. state; 1682 sq. mi.; pop. 2,625,000; **2061, 2482,** *map,* **2480;** Brooklyn, **515;** crops, **2485, 2486.**
**Long Island, battle of** (1776), **2061.**
**Long Island Sound,** arm of Atlantic between Long Island and mainland; 76 mi. long; *map,* **2480;** oyster fisheries, **2612, 2614–5.**
**Lon'gitude,** distance e. or w. on earth's surface, **2061, 1968;** how found at sea, **2420;** shown on *maps,* **2142;** and time, **3500–2.**
**Long Lake,** N.Y., in Adirondacks; 14 mi. long, 1 mi. wide; *picture,* **2481.**
**Long-leafed pine, 2808.**
**Long measure, 3715.**
**Long Parliament, 2689, 693;** Cromwell dismisses, *picture,* **925;** Hampden, **1570;** the "Rump," **924–5.**
**Long primer type, 3572.**
**"Longshanks,"** nickname of Edward I of England, **1088.**
**Longside,** Scotland, Mary Queen of Scots defeated, **2158.**
**Long's Peak,** Colo., one of highest peaks of Rocky Mts. (14,225 ft.), 50 mi. n.w. of Denver, **842, 998.**
**Longstreet, James** (1821–1904). Confederate Civil War general, one of the South's greatest fighters; distinguished himself at Bull Run, Fredericksburg, Chickamauga, and in battles of the Wilderness; U.S. minister to Turkey 1880–81; U.S. Railway Commissioner 1898–1904.
**Long ton, 3714, 3715.**
**Longworth, Nicholas** (1783–1863), Amer. business man and horticulturist; begins grape culture in Ohio, **2571.**
**Longwy** (*lôn-vē'*). Fortified frontier town in n.e. France; iron works; taken by Prussians in 1792 and 1815, and by Ger. troops in 1871 and 1914.
**Lookout, Cape,** in N.C., on isl. 70 mi. s.w. of Cape Hatteras; lighthouse; **2518.**
**Lookout Mountain,** peak near Denver, Colo.; Buffalo Bill's tomb, **528.**
**Lookout Mountain,** ridge in n.w. Ga. extending into Tenn. and Ala., **70;** battle (1863), **700–1.**
**Loom, 904;** development, **3327, 652;** first power loom in America, **2168;** Jacquard, **3327, 3080, 1937, 1949,** *pictures,* **3239, 1951–3;** Navajo, *picture,* **206;** for rug weaving, **3077,** *picture,* **3079;** silk, *pictures,* **3238, 3239;** tapestry, **3434;** wool, *picture,* **3786.**
**Looming,** a form of mirage, **2261.**
**Loon,** a diving water-bird, **2062.**
**Loos** (*lōs*), small village in n. France, 1 mi. n.w. of Lens; World War battle, **220.**
**Lope de Vega.** *See in Index* **Vega Carpio.**
**Lopez** (*lō'pās*), **Carlos Antonio** (1790–1862), dictator of Paraguay, **2677.**
**Lopez, Francisco Solano** (1826–70), dictator of Paraguay, **2677.**
**Lopez de Legaspi, Miguel** (1524–72), Span. soldier and navigator, conqueror of Philippines and founder of Manila, **2770.**
**Lopez de Villalobos** (*vēl-yä-lō'bōs*), **Ruy** (1500–44), Span. navigator; expedition to Philippines, **2770.**
**Lop-Nor.** Same as **Lob-Nor.**
**Lo'quat,** a plum-like fruit, **1378.**
**Lorain',** Ohio. Port and industrial city on L. Erie 26 mi. w. of Cleveland; pop. 37,295; ships coal, lumber, iron ore, farm products; makes iron and steel products, ships, etc.
**Lorca** (*lôr'kä*). Anc. city in s.e. Spain on R. Sangonera; pop. 71,000; trade center; scene of many battles between Christians and Moors.
**Lord.** A Brit. title borne by bishops, marquises, earls, viscounts, and barons; also borne as courtesy title by eldest sons of dukes, marquises, and earls, and younger sons of dukes and marquises; as title of office borne by Lord Chancellor, etc.
**Lord Dunmore's War,** expedition by Amer. colonists against Indian coalition formed to check expansion of Va. into what is now Ky. and W. Va., **3181.**
**Lord Protector,** Cromwell's title as head of the Commonwealth, **925.**
**Lords, House of,** upper house of Brit. Parliament, **2687–9;** Reform Bill crisis, **3083;** Home Rule Bill crisis, **1468;** veto power limited, **2040;** Judicial Committee of, **909.**

**Lord's Supper** or **Eucharist,** a sacrament, **764.**
**Lorelei** (*lō'rĕ-lī*), fabled Rhine siren; legend probably from an echoing rock of that name in the Rhine; **1628–9.**
**Lorenzo de' Medici** (1449–92), "the Magnificent," **2191, 1294;** patron of art, **2220, 3644, 1462.**
**Lorenzo de' Medici** (1492–1519), duke of Urbino, grandson of Lorenzo the Magnificent; statue by Michelangelo, **1293,** *picture,* **2191.**
**Lorgnette** (*lôr-nyĕt'*), **3310.**
**Lorient** (*lō-rē-äṅ'*), France. Fortified naval port in n.w. on Scorff R. at confluence with Blavet; pop. 50,000; large shipyards, arsenal; fisheries.
**'Lor'na Doone'** (*dọn*). Novel by R. D. Blackmore which made the Exmoor country famous; the heroine is an heiress kidnapped by outlaws and brought up in their wilderness fortress.
**Lorne** (*lôrn*), **Marquis of.** *See in Index* **Argyll, Duke of.**
**Lorne, Firth of,** inlet of Atlantic Ocean in w. coast of Scotland, **3146.**
**Lorrain, Claude.** *See in Index* **Claude Lorrain.**
**Lorraine** (*lō-rān'*), dist. of n.e. France (also called Lotharingia and Lothringen); extent in 843, **1446;** origin of name, **690;** taken by Charles the Bold. *See also in Index* **Alsace-Lorraine.**
**Lo'ry,** a parrot, **2690.**
**Los Angeles** (*lŏs ăn'ġĕ-lēz*), Calif., largest city on Pacific coast; pop. 576,673; **2062–3, 3592;** aqueduct, **164;** founding, **587.**
**"Lost Dauphin," 2067.**
**'Lost in Chicago',** story, **726–8.**
**Lot,** Abraham's nephew, **3.**
**Lothair' I** (795–855). Holy Roman emperor, grandson of Charlemagne; became joint ruler 817 when Louis I, his father, divided the Empire among his sons; after years of strife with his brothers received Italy and imperial title together with lands along Rhine and Rhone (Partition of Verdun, 843).
**Lothair II** (825–869). King of Lorraine, son of Lothair I; received as his kingdom dist. w. of Rhine between North Sea and Jura Mts., called after him Lotharingia or Lorraine (Ger. *Lothringen*).
**Lothair II** or **III, "The Saxon"** (1070?–1137). Holy Roman emperor 1133–37; created duke of Saxony 1106, and elected Ger. king 1125; a strong, capable ruler, whose reign was regarded as a golden age for Germany.
**Lotharin'gia.** *See in Index* **Lorraine.**
**Lothario** (*lō-thā'rĭ-ō*). In Rowe's tragedy 'The Fair Penitent', handsome, perfidious libertine, the proverbial "gallant, gay Lothario."
**Loti** (*lō-tē'*), **Pierre,** pen name of Louis Marie Julien Viaud (born 1850), Fr. novelist; exquisite stylist, whose studies of strange places are "log-books of sentiment," **1365;** chief works, **1366.**
**Lo'tus, 2063;** in Gk. myth., **2562;** pods eaten by Chinese, **744.**
**Lotze** (*lōt'sĕ*), **Rudolf Hermann** (1817–81). Ger. philosopher; opposed theory of "vital force" and was a founder of physiological psychology.
**Loubet** (*lụ-bā'*), **Emile** (born 1838). Fr. statesman, 7th pres. of Fr. Republic (1899–1906); remitted Dreyfus' sentence.
**Louis** (*lụ'ē*), kings of Bavaria. *See in Index* **Ludwig.**
**Louis I, the Pious** (778–840), king of France and Holy Roman emperor, youngest son of Charlemagne; **2064, 690.**
**Louis VI, the Fat** (1078–1137), king of France, **2064.**
**Louis VII** (1120–80), France, **2064, 930.**
**Louis VIII** (1187–1226), France, **2064.**
**Louis IX** (1215–70), "Saint Louis," France, **2064–5;** in Crusades, **932, 3549.**
**Louis X** (1289–1316), France, **2065.**
**Louis XI** (1423–83), France, **2065, 696, 1352;** struggles with Charles the Bold, **697;** private postal system, **2896.**
**Louis XII** (1462–1515), France, **2065.**
**Louis XIII** (1601–43), France, **2065, 3017;** in Thirty Years' War, **3488.**
**Louis XIV** (1638–1715), France, **2065–6;** aided by Colbert, **824–5;** E. India trade, **1073;** internal improvements, **1346;** aids James II of England, **1861;** literature under, **1364–5;** influence of Marquise de Maintenon, **2129;** Man in Iron Mask, **1827;** marriage, **3620;** Versailles palace, **3633;** wars, **1, 2150, 3741.**
**Louis XV** (1710–74), France, **2066;** builds Little Trianon, **3633.**
**Louis XVI** (1754–93), France, **2066–7, 1367, 1368;** calls Estates-General, **1367, 1179;** influence of Marie Antoinette, **2148;** and Mirabeau, **2259;** period of art, **1384;** popularized potato, **2900;** Robespierre demands death, **3027.**
**Louis XVII** (1785–95?), "the lost dauphin," **2067.**
**Louis XVIII** (1755–1824), France, **2067;** and Talleyrand, **3430.**
**Louis, the German** (804–76). King of the East Franks; 3d son of Louis the Pious and grandson of Charlemagne; his share of Charlemagne's empire after Partition of Verdun (843) formed nucleus of modern Germany.
**Louis I,** Holy Roman emperor. *See in Index* **Louis I, the Pious.**
**Louis II** (827–75). Emperor (crowned 850) and king of Italy (succeeded 839), son of Lothair I; fought Saracens and restored order in Italy.
**Louis III, the Blind** (880?–928). Emperor (crowned 901) and king of the Lombards (chosen 900), grandson of Louis II; his eyes were put out 905 by Berengar, rival king of the Lombards; thereafter lived in exile in Provence.
**Louis IV, the Bavarian** (about 1287–1347). Emperor (crowned 1328) and king of Germany (elected 1314); skilful, brave soldier, but lacking in decision; encouraged trade, befriended the towns, aided learning; warred with pope; added to possessions.
**Louis I** (1838–89). King of Portugal; succeeded 1861; abolished slavery in Port. colonies.
**Louis Napoleon.** Same as **Napoleon III.**
**Louis Philippe** (*fē-lēp'*) (1773–1850), "citizen-king" of France, **2067, 1353.**
**Louisburg,** shipping port and fishing village on Cape Breton Isl., Nova Scotia; pop. 1500; important fortress under French; captured 1745 by Amer. colonists, **1664;** captured 1758 by British, **2538, 1362, 3775.**
**Louise** (1776–1810). Queen of Frederick William III of Prussia; her beauty, goodness, and fortitude in misfortune made her a German heroine; Napoleon's rudeness to her after Eylau and Friedland hardened resolve of her son William I to humiliate France after Sedan.
**Louise, Lake,** Alberta, *pictures,* **600, 602.**
**Louisiade** (*lụ-ē-zē-äd'*) **Archipelago,** group of isls. off s.e. coast of New Guinea, belonging to Papua; **2451,** *map,* **2624–5.**
**Louisiana** (*lụ-ē-zē-ăn'ȧ*), a Gulf state of U.S.; 48,506 sq. mi.; pop. 1,798,509; cap. Baton Rouge; **2068–72,** *maps,* **2070, 3584–5;** chief cities, **2071, 2468–71;** Code of Laws, **2071;** "grandfather clause," **3385;** history, **2071–2, 2471, 2072–3;** levees, **2268;** lumber, **2070, 2071, 946;** manufactures, **2071;** meaning of name, **3347;** minerals, **2070, 3389, 3115;** natural features, **2068;** rice, **2068, 3015;** state flower, **3347;** sugar, **2068;** tobacco, **3509;** truck gardening, **2070.**
**Louisiana Purchase, 2072–3, 117–8,** *map,* **3605;** Lewis and Clark explore, **1989–90.**
**Louisiana Purchase Exposition,** at St. Louis, from Apr. 30 to Dec. 1, 1904; recorded admissions were 19,694,855; amusements on the "Pike"; 500 buildings, most of them architecturally very fine; floral clock with 50-ft. hands, six-acre rose garden, and other landscape features; **3109–10.**
**Louisiana State University and Agricultural and Mechanical College,** at Baton Rouge, La.; co-ed.; opened 1860; arts and sciences, agriculture, law, engineering, Audubon Sugar School, Teachers' College; **2068.**
**Louisville,** Ky., largest city of state on Ohio R.; pop. 234,891; **2073;** cement mfr., **676;** Christopher Gist, **1919–20.**
**Louisville, University of.** At Louisville, Ky.; co-ed.; founded by decree of the city council in 1837; arts and sciences, medicine, law.
**Lourdes** (*lụrd*). Town in s.w. France; place of Cath. pilgrimage; famous Grotto with healing springs; Church of the Rosary.
**Lourenço Marquez** (*lụ-rĕn'sō mär-kĕs'*), cap. of Port. E. Africa; pop. 14,000; **1070.**
**Louse,** a wingless, blood-sucking insect of the bug order, **1788, 1787;** bird, **2678, 1788;** body, **2677–8, 1452,** *picture,* **2679;** book, **1788;** eggs of head louse, *picture,* **1091;** sacculina, **2678,** *picture,* **2679.**
**Louse, plant.** *See in Index* **Aphids.**
**Louvain** (*lụ-văṅ'*), Belgium; pop. 40,000; burned by Germans in World War; **2073, 376.**
**Louvain, University of,** at Louvain, Belgium, founded 1425; leading scientific institution of medieval Europe, having 6000 students in 16th cent.; famous dept. of Rom. Cath. theology; active in Counter-Reformation; suppressed during Fr. Rev. but reëstablished 1817; library noted for rare books and manuscript collections; **2073.**
**L'Ouverture, Toussaint.** *See in Index* **Toussaint.**
**Louvois** (*lụ-vwä'*), **François Michel LeTellier, Marquis de** (1641–91). Fr. statesman, Louis XIV's great war minister and evil genius, who wasted prosperity of France and destroyed peace of Europe for military "glory."
**Louvre** (*lụ'vr*), art museum in Paris, **1198, 2684, 2372;** art treasures, *pictures,* **1203, 2371;** exterior, *picture,* **1203;** Hall of Augustus, *picture,* **1200.**
**Love-apple,** a tomato, **3512.**
**Love-bird, 2690.**
**Lovejoy, Elijah Parish** (1802–37). Amer. abolitionist; editor of an anti-slavery paper; killed by mob at Alton, Ill.
**Lovelace.** In Richardson's 'Clarissa', the hero-villain, a wealthy young libertine.
**Lovelace, Richard** (1618–58). Eng. Cavalier poet, immortalized by two lyrics ('To Lucasta, on Going to the Wars'; 'To Althea, from Prison'), **1164.**

**Lover, Samuel** (1797–1868), Irish novelist and poet; 'Handy Andy', a roaring farce dealing with an Irish servant lad's buffoonery; 'Rory O'More', with its brave, good-natured peasant hero, equally popular as novel and play; Lover's tendency to caricature makes his pictures of Irish life not entirely truthful; **1814.**

**'Love's Labour Lost'**, play by Shakespeare, **3190.**

**Low, Seth** (1850–1916). Amer. merchant, educator, and administrator, b. Brooklyn; mayor of Brooklyn 1882–86 (enforced first municipal civil-service rules adopted in America); pres. Columbia Univ. 1890–1901; mayor of Greater New York 1901–03.

**Low, Will Hicok** (born 1853). Amer. decorative painter, designer of stained glass, and illustrator, b. Albany, N.Y. (illustrations for Keats' 'Lamia'; frieze in legislative library, N.Y. state capitol).

**"Low,"** in weather forecasting, **3708.**

**Low Countries.** Eng. equivalent of "Netherlands," formerly applied to Belgium, Holland, and Luxemburg.

**Lowe, Sir Hudson** (1769–1844). Eng. general, fought throughout Napoleonic wars, conspicuous in campaigns of 1813 and 1814; custodian of Napoleon on St. Helena.

**Lowell, Abbott Lawrence** (born 1856). Amer. educator and political scientist, b. Boston; pres. of Harvard since 1909; restricted elective system; developed social life among students through freshman dormitories ('The Government of England'; 'Governments and Parties in Continental Europe').

**Lowell, Amy** (born 1874), Amer. poet and critic, b. Brookline, Mass.; sister of A. L. and Percival Lowell; leading "imagist" ('Tendencies in Modern American Poetry'; 'Sword Blades and Poppy Seeds'); **117.**

**Lowell, Francis Cabot** (1775–1817), Boston merchant, founder of U.S. cotton mfg. industry; b. Newburyport, Mass.; **2075.**

**Lowell, James Russell** (1819–91), Amer. poet, essayist, and critic, **2073–4, 113, 588;** estimate of Holmes, **1674;** quoted, **116;** tribute to Lincoln, quoted, **2017.**

**Lowell, John** (1743–1802). Amer. jurist, said to have been author of clause in Mass. state constitution declaring "all men are born free and equal"; this clause was interpreted 1783 by the Supreme Court of state to mean that slavery was abolished; father of Francis Cabot Lowell and grandfather of James R. Lowell.

**Lowell, Percival** (1855–1916), Amer. astronomer, b. Boston; brother of Amy and A. L. Lowell; lived in Japan 1883–93; establishes Lowell Observatory at Flagstaff, **200;** believes Mars to be inhabited, **2816.**

**Lowell,** Mass., one of greatest textile mfg. centers of U.S.; at junction of Concord and Merrimack rivers; pop. 112,759; **2075.**

**Lowell Observatory, 2552, 200.**

**Lower Austria.** A province in n.e. of Austria; 7639 sq. mi.; pop. 3,313,000; cap. Vienna.

**Lower California.** *See in Index* **California, Lower.**

**Lower Canada,** name formerly given to province of Quebec, **2947.**

**Lowestoft** (*lōz'tŏft*), England, seaport and summer resort of Suffolk, 110 mi. n.e. of London; pop. 34,000; important fisheries; captured by Cromwell 1643; Dutch fleet defeated by Duke of York 1665; former porcelain mfrs., **2883.**

**Low German,** language, **1435.**

**Lowlands,** of cent. Scotland, **3146.**

**Loyalists, United Empire.** *See in Index* **United Empire Loyalists.**

**Loyal Legion, Military Order of, 2695.**

**Loyalty Islands,** Pacific group 60 mi. e. of New Caledonia; 800 sq. mi.; export copra and rubber; **2620, 2624.**

**Loyola** (*loi-ō'là*), **Ignatius de** (1491–1556), founder of Jesuit Order, **2075;** burial place, **3055;** and Counter-Reformation, **2987, 2989;** converts Francis Xavier, **3823.**

**Loyola College.** At Baltimore, Md.; men; Cath. (Jesuit); founded 1852; liberal arts.

**Luba'o.** Town of Luzon, P.I.; in rice and sugar dist.; pop. 21,000.

**Lubber's** or **granny knot, 1938.**

**Lub'bock, Sir John.** *See in Index* **Avebury.**

**Lübeck** (*lü'bĕk*), Germany, free city on Trave R. 12 mi. from Baltic Sea; pop. 113,000; many fine medieval buildings; diversified mfrs. and considerable Baltic trade; cap. of city-state of Lübeck (115 sq. mi.; pop. 120,000); **1440;** as head of Hanseatic League, **1576.**

**Lublin** (*lụ'blēn*), Poland. City 95 mi. s.e. of Warsaw; pop. 73,000, one-half Jews; flourished in 12th cent.; Rus. victory over Austrians in early part of World War.

**Lu'bricants,** substances used to diminish friction, **1370;** castor oil, **657;** graphite, **1502;** petroleum products, **2749, 2753, 2754.**

**Lubrica'tion system,** in gas engine, **1404.**

**Luca della Robbia.** *See in Index* **Robbia.**

**Lu'can** (Marcus Annaeus Lucanus) (39–65 A.D.). Rom. poet, author of 'Pharsalia', epic on civil war between Caesar and Pompey.

**Lucas, Edward Verrall** (born 1868). Eng. essayist, novelist, and biographer; "the modern Charles Lamb"; widely popular for his genial humor and broad sympathies ('The Open Road'; 'Life of Charles Lamb'; 'London Lavender').

**Lucas, John Seymour** (born 1849), Eng. historical and portrait painter; 'William the Conqueror Granting Charter to City of London', *picture,* **3740.**

**Lucas Van Leyden** (Lucas Jacobsz) (1494?–1533). Dutch painter and engraver, friend of Dürer.

**Lucca** (*lụk'kä*). Old and picturesque city in n. Italy, 12 mi. n.e. of Pisa; pop. (commune) 79,000; many antiquities; textiles; large trade.

**Lucerne** (*lụ-sĕrn'*) or **Luzern,** Switzerland, cap. of canton of Lucerne, at n.w. end of L. Lucerne; pop. 44,000; favorite tourist resort; Thorwaldsen's Lion', **3158.**

**Lucerne,** or alfalfa, **88–9.**

**Lucerne, Lake of** (Vierwaldstättersee). Famous and beautiful mountain-rimmed lake in cent. Switzerland; 24 mi. long.

**Lu'chu** or **Loochoo Islands.** Same as **Nansei Islands.**

**'Lucia di Lammermoor'.** Opera by Donizetti, based on Scott's 'Bride of Lammermoor'.

**Lucian** (*lū'shăn*) (120?–180? A.D.), Gk. satirist and humorist, **1538.**

**Lucifer** (*lū'sĭ-fĕr*). Name of Venus as morning star; applied by Isaiah to king of Babylon ("How art thou fallen from heaven, O Lucifer, son of the morning!"), and, through misunderstanding of this passage by later writers, to Satan.

**Lucil'ius, Gaius** (180?–103 B.C.), Rom. satirist, **1966.**

**Luck'now,** mfg. and r.r. center in n.-cent. India; famous for heroic defense in Indian Mutiny; pop. 260,000; **2075, 1753.**

**'Luck of the Calico Horse',** story, **1686–7.**

**Lucretia** (*lū-krē'shĭ-à*). Rom. matron whose suicide because of outrage inflicted by Sextus, son of King Tarquin the Proud, provoked expulsion of the Tarquins.

**Lucretia Borgia.** *See in Index* **Borgia, Lucretia.**

**Lucretius** (*lū-krē'shĭ-ŭs*) (Titus Lucretius Carus) (96?–55 B.C.), Rom. poet-philosopher, **1967.**

**Lucullus** (*lū-kŭl'ŭs*), **Lucius Licinius** (110?–56? B.C.). Immensely wealthy Rom. noble, conqueror of Mithridates; "Lucullan luxury" has become proverbial.

**Lucy, Sir Thomas** (1532–1600), Eng. squire, justice of peace, said to have prosecuted Shakespeare, **3189.**

**Lud,** legendary king of Britain, **2050.**

**Lud'dites.** Bands of workmen organized in England to smash machinery 1812–18 in protest against displacement of hand labor.

**Lu'dendorff, Erich von** (born 1865), Ger. general, **2076, 3804.**

**Lud'ington,** Mich., commercial city and resort on L. Michigan and Marquette R. 75 mi. n.w. of Grand Rapids; pop. 8810; ships lumber and salt; car ferries, **2227.**

**Lud'low,** England. Old town in s. Shropshire; ruined castle, once stronghold against Welsh.

**Ludovico il Moro,** duke of Milan 1479–1500; patron of Leonardo, **3644.**

**Ludwig** (*lụt'vĭĸ*) **I** (1786–1868), king of Bavaria, munificent patron of art; forced to abdicate by revolution in 1848; beautifies Munich, **2369.**

**Ludwig II** (1845–86). King of Bavaria, grandson of Ludwig I; patron of Richard Wagner; became insane and committed suicide.

**Ludwig III** (1845–1921). King of Bavaria; crowned 1913, abdicated 1918.

**Ludwig, Otto** (1813–65), Ger. dramatist and novelist; chief works, **1438.**

**Ludwigshafen** (*lụt'vĭĸs-hä-fĕn*). Chief city of Rhine Palatinate, Bavaria, on Rhine opposite Mannheim; world's largest chemical works and other mfrs.; large trade in coal, timber, iron; pop. 91,000.

**Luf'bery, Raoul** (1884–1918). Amer. World War aviator, leading Amer. "ace."

**Lugano** (*lụ-gä'nō*), **Lake of.** Deep narrow lake enclosed by mts., partly in Switzerland, partly in n. Italy, between L. Maggiore and L. Como; 20 mi. long.

**Luke, Saint,** traditional author of the Third Gospel and of the Acts, **157.**

**Luke, Gospel of Saint,** Third Gospel and 3d book of New Testament, attributed to Luke, **1887, 157, 2745.**

**Luks, George Benjamin** (born 1867), Amer. painter, **2634.**

**Luktchun.** A depressed basin in n.w. China, nearly 400 ft. below sea level.

**Lule** (*lụ'lĕ*) or **Lulea,** a river in n. Sweden; 200 mi. to Gulf of Bothnia; *map,* **2531.**

**Lulea** (*lụ'lē-à*), Sweden, seaport on Gulf of Bothnia; pop. 9000; shipbuilding; lumber and iron; icebound in winter, **3403.**

**Lumber and timber, 2076–83,** *pictures,* **2077–81, 2456, 1728;** Canada, **610, 2076,** *pictures,* **606–7;** Chicago, **721;** chief commercial varieties, **2082;** creosote treatment, **814, 918;** Great Lakes region, **1759, 2224, 2256, 3770, 2485;** Memphis, **2198;** New England, **2126, 2454, 3632,** *picture,* **2456;** Pacific states, **577, 3176, 2594, 3687, 3688;** pine most useful to man, **2807–8;** Southern

states, **207, 1432, 2070–1, 3468;** U.S. resources, **3590, 3583, 870;** veneer, **3620.** *See also in Index* **Forestry; Forests; Wood;** also names of countries, states, and trees.

**Lumpsucker,** a mail-cheeked fish of the spiny-finned group, *picture,* **1275.**

**Lu'na.** In Rom. myth., the goddess of the moon and of months.

**Luna moth, 546.**

**Lunar caustic,** or silver nitrate, **3242.**

**Lunar month, 2317.**

**Lun'dy Benjamin** (1789–1839). An Amer. philanthropist, prominent in anti-slavery movement, b. Hardwick, N.J.; published anti-slavery magazine and lectured against slavery in many states.

**Lundy's Lane, battle of,** engagement in War of 1812, between Brit. and Amer. forces near Niagara Falls on Canadian side, **3672.**

**Lüneburg** (*lü'nē-bŭrĸ*), dist. of e. Hanover, Prussia; contains Lüneburger Heide (Lüneburg Heath), about 55 mi. long; peat, **1440.**

**Lüneburg,** Germany. Town of Hanover 22 mi. s.e. of Hamburg; pop. 28,000; was prominent member of Hanseatic League; cement works, salt spring.

**Lunéville** (*lü-nā-vēl'*). Town of n.e. France 18 mi. s.e. of Nancy; pop. 26,000; important cavalry school; treaty between France and Austria (1801).

**Lung-fish,** a fish with both gills and lungs, **2863–5, 3948,** *picture,* **1272.**

**Lungs,** organs for land-breathing, **2083, 2998–9;** of land snail, **3256;** in lung-fish, **1274, 3948;** modified type in land crabs, **912;** spider, *picture,* **3323.**

**Lungwort.** A plant with leaves marked with white blotches suggestive of disease spots in human lung, and hence believed by old herbalists to have medicinal value in lung diseases.

**Luperca'lia,** Rom. spring festival in honor of anc. god Lupercus, **1673;** St. Valentine's Day, **3111.**

**Lu'pines,** various plants of the bean family, with white, yellow, or blue flowers on a central spike; contain poison, **2854.**

**Lupu'lin,** an alkaloid, the active principle of hops, **1680.**

**Luque, Hernando de,** partner of Pizarro, **2814.**

**Luray' Cavern,** large limestone cave in Page County, Va., celebrated for stalactites, **666, 3648.**

**Lurs,** nomadic people of Persia, probably of Aryan origin, **2735, 2734.**

**'Lu'siad',** epic by Camoens, **2889.**

**Lusitania** (*lū-si-tā'ni-ȧ*). Anc. Rom. province comprising most of modern Portugal and s.w. Spain.

**'Lusitania',** Brit. ocean liner, torpedoed and sunk by Germans May 1915, **3746–7, 3791, 3799.**

**Lute.** Anc. pear-shaped stringed instrument of Arabian origin.

**Lute'cium,** a rare element, **4042.**

**Lutetia** (*lū-tē'shi-ȧ*), anc. name of Paris, France, **2685.**

**Luther, Martin** (1483–1546), leader of Protestant Reformation, **2084–5, 2987–8,** *pictures,* **1435, 2084, 2988;** Charles V opposes, **691;** Henry VIII opposes, **1636;** influence on Ger. language, **1436;** and Zwingli, **3842.**

**Lu'theranism,** early spread of, **2988, 3488;** number of adherents, **2994;** in Scandinavian countries, **2536, 3404.**

**Luther College.** At Decorah, Iowa; men; Luth.; founded 1861; liberal arts.

**Lützen** (*lüt'sĕn*), Germany, town in Saxony; battle of (1632), **1554.**

**Luxembourg** (*lüks-ȧn-bur'*) **Palace,** Paris, **2684;** gallery decorated by Rubens, **3076;** gardens, *picture,* **2684.**

**Lux'emburg, Rosa** (1870–1919). Ger. (Jewish) socialist agitator, cripple, but a fiery orator; nicknamed "Red Rosa"; killed in Berlin riots.

**Luxemburg,** grand duchy of n.w. Europe, surrounded by France, Germany, and Belgium; 1000 sq. mi.; pop. 265,000; **2085–6,** *map,* **373;** iron mines, **1820, 2085;** woman suffrage, **3779.**

**Luxemburg,** cap. of grand duchy of that name; pop. 20,000; **2086.**

**Luxemburg, House of, 2086, 447, 1675.**

**Lux'or,** village in Upper Egypt on part of site of anc. Thebes, near Karnak; famous for splendid ruins; **1104, 569–70;** statue of Rameses II, *picture,* **1106;** temple of Karnak, **1104,** *pictures,* **1101, 1103, 1104, 1105, 178.**

**Luzern.** Same as **Lucerne.**

**Luzon** (*lu-zŏn'*), largest and most important of Philippine Isls.; 40,814 sq. mi.; contains Manila, cap. of isls.; **2764, 2766.**

**Lwow.** Same as **Lemberg.**

**Lycée** (*lē-sā'*), Fr. school, **3140.**

**Lyceum** (*lī-sē'ŭm*), Aristotle's school, **196, 1538.**

**Lycia** (*lĭs'i-ȧ*). Anc. division of s.w. Asia Minor on Mediterrancan; conquered by Persia 6th cent. B.C., then subject in turn to Macedon, Egypt, Syria, and Rome.

**'Lycidas'** (*lĭs'i-dȧs*), poem by Milton in commemoration of the death of his friend, Edward King, drowned at sea, **2242.**

**Lycurgus** (*lī-kûr'gŭs*) (9th cent. B.C.), lawgiver of anc. Sparta, **2086.**

**Lyd'da,** anc. city of Palestine, 10 mi. s.e. of Joppa; modern village called Ludd; legend of St. George, **1430.**

**Lyd'dite,** an explosive derived from picric acid, **1212.**

**Lyd'ia,** anc. kingdom in Asia Minor; early seat of Asiatic civilization with important influence on Greeks; later part of Rom. province of Asia; *map,* **1518;** under Croesus, **923;** earliest known coins, **2281.**

**Lydia Languish.** In Sheridan's comedy 'The Rivals', a sentimental romantic heiress.

**Lye** (*lī*), watery solution of a caustic, particularly potassium hydroxide; antidote, **1270;** leached from ashes, **2899–2900;** in soaps, **3263, 3267.**

**Ly'ell, Sir Charles** (1797–1875), Brit. geologist; his studies and evidence established Hutton's "uniformitarian" theory of earth's evolution as foundation of modern geology; proof of inorganic evolution led, in hands of Darwin and others, to idea of organic evolution; Darwin's debt to, **964.**

**Lyly** (*lĭl'i*) or **Lilly, John** (1553?–1606), Eng. romancer and dramatist who introduced into Eng. literature the fantastic style of writing called "euphuism," **2539.**

**Lyme** (*līm*) **grass,** a coarse grass which grows in poor soil in cold and temperate climates; called also wild rye; *picture,* **1502.**

**Lymph** (*limf*), body fluid resembling blood save in lack of red corpuscles; fills lymphatic system; found in bones, **452.**

**Lymphat'ic glands,** small glands scattered throughout lymphatic system, but especially in the neck, armpits, groin, thighs, and body organs; produce corpuscular elements of lymph, including white corpuscles, **437.**

**Lymphatic system.** A double network of vessels containing lymph, and permeating body, except brain and spinal cord, the eyeball, cartilage and tendon structure; superficial network underlies skin, deep network permeates organs; conveys waste matter and forcign substances to blood; portion called lacteals conveys chyle from intestines.

**Lynch, Charles** (1736–96), Amer. politician and soldier; "lynching" named from, **2087.**

**Lynchburg,** Va., industrial city 95 mi. s.w. of Richmond in mt. pass; pop. 30,070; trade center, with large tobacco interests; Randolph-Macon Woman's College; supply depot for Confederates during Civil War; industries, **3650.**

**Lynching, 2086–7.**

**Lynette** (*lī-nĕt'*), in Arthurian legend, **3070.**

**Lynn** (*lin*), Mass., a leading shoe mfg. city of U.S., near Boston; pop. 99,148; **2087, 2165.**

**Lynnhaven Bay,** on coast of Va. w. of Norfolk; oysters, **3648.**

**Lynx** (*links*), a large cat-like animal with short tail and tufted ears, **2087–91;** belongs to cat family, **658;** fur, **1390;** story, 'The Lynx with Wings', **2088–91.**

**Ly'on, Mary** (1797–1849). Amer. educator, founder of Mt. Holyoke College, and leader in movement for higher education for women.

**Lyon, Capt. Nathaniel** (1818–61), Amer. soldier, prominent opponent of "states' rights" and slavery, b. Ashford, Conn.; organized Unionist troops in Mo.; killed while leading charge against Confederates in battle of Wilson's Creek; **2273.**

**Lyons** (*lī'ȯns*) or **Lyon** (*lē-ȯn'*), France, 3d city of France, noted for silks; at junction of Rhone and Saone; pop. 525,000; **2092.**

**Ly'ra** or **Lyre,** constellation across North Pole from Little Bear; earth approaching, **1064;** nebula, **2432.**

**Lyre** (*līr*), harplike instrument of Greeks, *picture,* **2382;** legendary invention by Hermes, **1589, 1644;** lyric poetry named from, **2851.**

**Lyre-bird, 2092;** altitude range, *picture,* **397;** color plate, **2676–7.**

**'Lyrical Ballads'** (1798), volume of poems by Wordsworth and Coleridge, **3788, 1036.**

**Lyr'ic poetry,** defined, **2851.**

**Lyrids,** swarm of meteors, **2204.**

**Lys** (*lēs*) **River,** rises in extreme n. of France and flows n.e. 120 mi. past Armentières and Courtrai to the Scheldt R. in Belgium; commerce in Middle Ages, **373;** axis of 2d Ger. offensive (Apr. 9–26, 1918), **1662.**

**Lysander** (*lī-sȧn'dēr*) (d. 395 B.C.). Able unscrupulous Spartan admiral; defeated Athens at Aegospotami and terminated Peloponnesian War, becoming most powerful man in Greece; killed at outbreak of Boeotian War before he could make himself supreme.

**Lys'ias** (459–380 B.C.), onc of great Attic orators, **1537.**

**Lysicrates** (*lī-sĭk'rā-tēz*), monument of, *picture,* **250.**

**Lysippus** (*lī-sip'ŭs*) (4th cent. B.C.), Gk. sculptor, **1532;** statue of Hercules, **1641.**

**Ly'sol,** a disinfectant, **814.**

**Lyt'ton, Edward Bulwer-Lytton, Baron** (1803–73). Eng. novelist, playwright, and politician ('Last Days of Pompeii'; 'Lady of Lyons').

**Lytton, Edward Robert Bulwer-Lytton, Earl of** (1831–91). Eng. statesman and poet, son of the preceding; viceroy of India 1876–80; better known under pen name of "Owen Meredith" ('Lucile', sentimental novel in verse, adored by ringleted young ladies of past generation).

# M

SIX thousand years ago our letter M was an owl, and to this day you can see the owl's horns in those two peaks, yes, and the beak between them, right where it is in the real owl. It must have taken considerable time to draw the owl as it appeared in Egyptian picture-writing and so a very much simplified form was developed by the Egyptian scribes who wrote on papyrus. The early Phoenicians, carving on stone, naturally gave the letter a more angular character It is easy to see how this developed into the symmetrical Greek and Roman M which we use. In sound *m* is called a labial nasal. It is made by sending the breath through the nose while the lips are closed and the vocal chords are vibrating.

**Maarten Maartens** (*mär'tĕnz*). Pen name of J. M. W. Schwartz (1858–1915). Dutch novelist; wrote in English ('The Sin of Joost Avelingh'; 'God's Fool').

**Maas** (*mäs*), Dutch name for Meuse R., **2207.**

**Maastricht.** Same as **Maestricht.**

**Mab** (*măb*). "Queen Mab," in Celtic and Eng. folklore, a fairy presiding over dreams; mentioned in Shakespeare's 'Romeo and Juliet', I, iv; originally a legendary queen Maev of Connaught.

**Mabie** (*mā'bi*), **Hamilton Wright** (1846–1916). Amer. editor, critic, and essayist, b. Cold Spring, N.Y. ('My Study Fire'; 'Essays in Literary Interpretation').

**Mabinogion** (*măb-ĭ-nō'gĭ-ŏn*). A collection of anc. Welsh bardic tales, particularly the collection of 12th cent. knightly romances translated by Lady Charlotte Guest (Sidney Lanier's 'Boy's Mabinogion' good recent edition).

**Mabuse** (*mà-bŭz'*), **Jan.** Name adopted by the Flemish painter Jenni Gosart (d. 1532), first of the "Italianized" Flemings.

**MacAdam** (*măk-ăd'ăm*) or **McAdam, John Loudon** (1756–1836), Scotch engineer and inventor, **3024, 3026.**

**Macadam roads, 3024, 3026.**

**McAdoo** (*măk'ă-dọ*), **William Gibbs** (born 1863). Amer. lawyer and financier, b. near Marietta, Ga.; sec. of treasury under Pres. Wilson 1913–18, and director-general of railroads during World War 1917–19; directed construction of Hudson tunnels 1902–09.

**McAl'ester,** Okla. A r.r. and shipping city 66 mi. s.w. of Muskogee; pop. 12,095; center of immense coal fields and large stockraising interests; extensive wholesale trade.

**Macalester College.** At St. Paul, Minn.; co-ed.; Presb.; founded 1885; arts, sciences, music.

**McAl'lister, Ward** (1830?–95). Amer. society leader, remembered as originator of the phrase "the 400" designating "smart" New York society.

**MacAlpine, Kenneth.** *See in Index* **Kenneth I, MacAlpine.**

**'MacAndrew's Hymn',** poem by Kipling, **1927.**

**Macao** (*mà-kä'ō*), China. Port. settlement and seaport on w. shore of Canton R. 40 mi. w. of Hongkong; pop. 75,000; Camoens here finished the 'Lusiad'.

**Macaque** (*mà-kăk'*), or bonnet monkey, **2292,** *picture,* **2291;** hand, *picture,* **153.**

**Macaroni** (*măk-à-rō'nĭ*), a dandy, **3828.**

**Macaroni,** wheat paste, **2093.**

**Macaron'ic verse.** Humorous verse jumbling two or more languages.

**MacArthur, Arthur** (1845–1912). Amer. general, b. Springfield, Mass.; served in Civil and Span.-Amer. wars; military gov. of Philippines 1900–01.

**Macassar** (*mà-kăs'ăr*). Seaport and cap. of Celebes, Dutch E. Indies, on w. coast of s. peninsula of isl.; pop. 27,000; source of "thine incomparable oil, Macassar," which, used in England in 19th cent. as pomade, gave rise to "anti-macassars" or "tidies" to protect chairbacks.

**Macassar, Strait of.** A channel separating isls. of Borneo and Celebes, uniting Java Sea and Celebes Sea, and marking a celebrated biological division. *See in Index* **Wallace's Line.**

**Macau'lay, Thomas Babington, Baron** (1800–59). Eng. essayist and historian, **2093–4, 1167;** charges against Hastings, **1596;** essays, **1178;** quoted on Gladstone, **1468;** quoted on Reformation, **2989;** story of Horatius, **3494–5.**

**Macaulay, Zachary,** father of the historian, **2093.**

**McAuley, Catherine** (1787–1841). Irish philanthropist, founder of the Cath. order of Sisters of Mercy.

**Macaws',** S. Amer. parrots, **2094,** color plate facing **2690.**

**Macbeth'** (d. 1057), usurping king of Scotland, hero of Shakespeare's tragedy, **2094, 3191,** *picture,* **3193;** quotations from play, **3192, 3193.**

**McBurney, Charles** (1845–1913). Amer. surgeon, discoverer of "McBurney's point" (distinctive sign of appendicitis), and pioneer in aseptic technique.

**Maccabees** (*măk'à-bēz*), distinguished Jewish family dominant in Jerusalem in 2d cent. B.C., descendants of the brave priest Mattathias; chief member Judas (d. 160 B.C.); story told in apocryphal Books of Maccabees; **1891.**

**McCarter, Margaret Hill** (born 1860). Amer. novelist, b. Charlottesville, Ind., but identified by residence and writings with Kansas ('The Cottonwood's Story'; 'Winning of the Wilderness').

**McCarthy, Charles** (1873–1921), Amer. librarian and lecturer, b. Brockton, Mass., **3771.**

**McCarthy, Justin** (1830–1912). Irish historian, journalist, and Nationalist leader ('History of Our Own Times'; 'Modern England').

**McClel'lan, George Brinton** (1826–85), Amer. general, **2094–5;** at Antietam, **149;** defeated Lee in Seven Days' battles, **2095, 778, 1984;** defeated by Lincoln for president, **2095, 2014.**

**McClin'tock, Sir Francis Leopold** (1819–1907). Brit. admiral and Arctic explorer who made 4 expeditions in search of Sir John Franklin's expedition.

**McClos'key, John** (1810–85). Rom. Cath. prelate, b. Brooklyn, N.Y.; bishop of N.Y.; first Amer. cardinal.

**McClure, Sir Robert John LeMesurier** (1807–73), Irish admiral and Arctic explorer; discoverer of Northwest Passage, **2860;** route, *map,* **110.**

**McClure, Samuel Sidney** (born 1857). Amer. editor, publisher, and author, b. Ireland; founder of *McClure's Magazine,* pioneer "muck-raking" periodical; "discoverer" of many of the members of its brilliant staff of writers ('My Autobiography').

**McCormack, John** (born 1884). Irish tenor, prodigiously popular on Amer. concert platform.

**McCormick, Cyrus Hall** (1809–84), inventor of harvesting machinery, **2095, 3731.**

**McCrae** (*mà-krā'*), **John** (1872–1918), Canadian physician, soldier, poet; served in Boer War and World War; author of 'In Flanders Fields'; **624.**

**McCul'loch, Hugh** (1808–95). Amer. financier, b. Kennebunk, Me.; comptroller of the currency 1863–65 and sec. of the treasury 1865–69 and 1884–85.

**'McCulloch** *vs.* **Maryland',** case in U.S. constitutional law, **2155.**

**MacCullough** (*mà-kŭl'ō*), **John Edward** (1837–85). Amer. tragedian, b. Ireland; acted with Booth and Forrest.

**McCutch'eon, George Barr** (born 1866). Amer. novelist, b. near Lafayette, Ind.; brother of John T. McCutcheon ('Graustark'; 'Brewster's Millions').

**McCutcheon, John Tinney** (born 1870). Amer. cartoonist and war correspondent, b. near South Raub, Ind.; on staff Chicago *Tribune* since 1903.

**Macdonald, Flora** (1722–90). Scotch Jacobite heroine, **2915.**

**Macdonald, George** (1824–1905). Scotch poet, preacher, novelist ('David Elginbrod', etc.), and writer for children ('At the Back of the North Wind', and other fairy tales).

**Macdonald, Jacques Etienne J. A.** (1765–1840). Marshal of France and duke of Taranto; broke Austrian center and won victory of Wagram; created marshal by Napoleon on that battlefield.

**Macdonald, Sir John Alexander** (1815–91). Canadian statesman, first premier of the Dominion, in power for 19 years, **2096, 618.**

**Macdonald College.** At Ste. Anne de Bellevue, Quebec; co-ed.; non-sectarian; founded 1907; agriculture, domestic science, teachers' training; affiliated with McGill Univ.

**Macdon'ough, Thomas** (1786–1825), Amer. commodore, often called the "hero of Lake Champlain," **3672.**

**MacDow'ell, Edward A.** (1861–1908), Amer. musician, b. N.Y.; called greatest and most original of Amer. composers and "Wordsworth of music"; rank in modern music, **2380;** chief works, **2381.**

**McDowell, Irvin** (1818–85), Amer. Civil War general; defeat at Bull Run, **533.**

**Mace,** a spice, **2544–5.**

**Macedonia** (*mās-ē-dō'ni-ȧ*), a region of s.e. Europe, once seat of empire under Alexander the Great; most of it ceded to Greece by Turkey in 1913; pop. over 2,000,000; **2096–7,** *maps,* **1518, 308;** chief events of history summarized, **1656;** rise of empire, **85–7, 1525** (*see also in Index* **Alexander the Great);** Roman conquest, **1525;** divided after Balkan Wars, **3115.**

**Maceio** (*mä-si-ō'*) or **Maçayo,** Brazil. Important port on Atlantic coast, 135 mi. s.w. of Pernambuco; pop. 68,000.

**McEw'en, Walter** (born 1860). Amer. landscape, portrait, and mural painter, b. Chicago ('Sunday in Holland'; 'Greek Heroes', in Congressional Library).

**McFee, William** (born 1881). Eng. novelist, writer of sea stories; went to sea (1905) as engineer and has done most of his work at sea ('Casuals of the Sea'; 'Captain Macedoine's Daughter').

**McGee, Thomas D'Arcy** (1825–68), Irish-Canadian poet, historian, and journalist, **623.**

**McGill College and University.** A leading Canadian institution, at Montreal; chartered 1821, opened 1829; co-ed., non-sectarian; arts, law, medicine, applied science, agriculture, music, etc.; graduate courses; several affiliated colleges.

**McGivney, Michael J.,** founder of Knights of Columbus, **1935.**

**MacGreg'or, Robert,** real name of Rob Roy, **3033.**

**Mach** (*mäĸ*), **Ernst** (1838–1916). Austrian physicist and psychologist; professor of physics at Prague 1867–95, at Vienna 1895–1901; strongly influenced modern scientific and philosophical thought.

**McHenry, Fort.** *See in Index* **Fort McHenry.**

**Machete** (*mä-chā'tā*), cleaver-like knife used as tool and weapon in Span.-Amer. countries, *picture,* **3422.**

**Machiavelli** (*mä-kē-ä-vĕl'lē*), **Niccolo** (1469–1527), Ital. diplomat and writer; sec. of Florentine republic; founder of modern science of politics; discarded morality as political principle ('The Prince', idealization of Caesar Borgia, foreshadowed 16th and 17th cent. identification of the monarch with the state); **1294, 2997;** quoted on Guelf-Ghibelline troubles, **1293.**

**Machine, flying.** Same as **Airplane.**

**Machine gun, 2097–2101;** in operation, *picture,* **3798.**

**Machinery,** mechanical devices for doing work; agricultural, **43–4, 2095, 2983, 3493–4,** *pictures,* **47, 605, 1631;** automobiles, **274–87;** basket weaving, *picture,* **342;** bread-making, *pictures,* **496–500;** brick-making, **503,** *picture,* **504;** cable-laying, *picture,* **557;** candy-making, **628–30, 755–6;** cement, **676,** *pictures,* **675;** centrifugals, **682;** cheese-making, *pictures,* **708, 709;** churn, *picture,* **951;** clothing industry, **805–7;** coal-mining, **2250,** *pictures,* **812–3, 815;** coffee-roasting, *picture,* **823;** coin-making, **2258;** copper-reducing, *pictures,* **882–3;** cotton gin, **902;** cream separator, **950;** dredges and steam shovels, **1039–41,** *pictures,* **1481, 2506;** effect on civilization, **774, 1778;** electrical, **1124–5, 1050–2, 2121–2;** elevators, **1132;** embroidery-making, **1140;** flour milling, **1302–3;** gas engines, **1403–6;** hat- and cap-making, **1597,** *pictures,* **1599;** hydraulic, **1708–10;** iron and steel mfg., **1815–26;** knitting, **1935–7;** lace-making, **1949–53;** laundry, **1969;** leather-making, *pictures,* **1977–9;** logging and lumber-working, *pictures,* **2078–81;** machine tools, **3514–5;** match-making, **2174,** *pictures,* **2171–3;** micrometer, **2227;** nail-making, **2388,** *pictures,* **2387;** oil drills, **2752,** *picture,* **2750;** oleomargarine, **2577–8;** paper-making, **2668–73;** pencil-making, **2712–4;** pen-making, *picture,* **2711;** phonograph, **2774–6;** pin-making, **2807;** pneumatic appliances, **2846–7;** potter's wheel, **2904,** *pictures,* **2903, 2907;** printing, **2472–5, 2916,** *pictures,* **459–63, 2917, 3599, 3666, 3667;** pumps, **2934, 2935,** *pictures,* **3696;** quarrying, **2943–5;** refrigerating, **2989–92;** rope- and twine-making, **3063–5;** salt-making, *pictures,* **3117;** sewing, **3186–8;** shoemaking, **3221–2;** soap-making, *pictures,* **3264–5;** spinning and weaving, **902–4, 3326–7,** *pictures,* **3237–9, 3783–6;** sugar-making, **3386–8;** thread-winding, **3493;** tire-making, *pictures,* **3072–5;** type-casting, **3572, 2019–23, 2303–5;** steam engine, **3348–52, 3704–5;** turbines, **3553–4;** water wheels, **3695;** windmills, **3749;** wire-making, *pictures,* **1482;** wood-working, *pictures,* **1386–7.**

**Machines** (physics): friction in, **1370;** gyroscopic, **1555–6;** pendulum, **2715;** principles studied in mechanics, **2187–90, 1148.**

**Machines, calculating, 571–2, 196, 653, 677–8.**

**Machines, electrostatic,** devices for generating electricity by friction, **1112.**

**Machine tools, 3514–6.**

**Maciejowice** (*mät-sē-ā-yō-vēt'sā*), **battle of** (1794), **1944.**

**Mac'intosh, Charles** (1766–1843), Scottish chemist, inventor of water-proof fabrics and various new chemical processes, **3072.**

**Mackail', John William** (born 1859), Eng. scholar and critic; professor of poetry Oxford Univ. 1906–11; translations of Gk. and Latin literature, with criticisms; married daughter of Burne-Jones; quoted, **1966.**

**McKay, Gordon** (1821–1903), Amer. inventor, b. Newport, R.I.; inventions of boot and shoe machinery revolutionized that industry; **3222.**

**Mackay** (*mȧ-kā'*), **John W.** (1831–1902), American capitalist, b. Ireland; one of discoverers of Bonanza mines of Comstock lode, Nev.; statue, *picture,* **2446.**

**Mackaye** (*mȧ-kī'*), **Percy** (born 1875), Amer. dramatist, b. New York City, writer of numerous community masques and plays of diversified themes; chief works, **1038.**

**McKeesport,** Pa. Industrial city on Monongahela and Youghiogheny rivers 12 mi. s.e. of Pittsburgh, in bituminous coal region; pop. 45,781; vast steel and iron works and tin plate plant.

**McKees Rocks,** Pa. Industrial borough on Ohio R. 3 mi. n.w. of Pittsburgh; pop. 16,713; ships considerable lumber; iron and steel products, wall plaster, concrete.

**McKen'na, Reginald** (born 1863). Brit. statesman and financier, liberal member House of Commons 1895–1918; first lord of Admiralty 1908–11; home secretary 1911–15; chancellor of the exchequer 1915–16.

**Mack'ensen, August von** (born 1849), Ger. general, associate of Ludendorff and Hindenburg in World War; commanded decisive offensives against Serbia and Rumania; defeated Russians, **3794.**

**Macken'zie, Sir Alexander** (1755–1820), Scottish explorer; employee Northwest Fur Co.; discovered Mackenzie R., and was first white man to reach Pacific overland; **617, 2102, 623.**

**Mackenzie, Alexander** (1822–92), Canadian Liberal statesman, b. Scotland; premier 1873–78; administration introduced vote by ballot, created supreme court of Canada, and organized territorial govt. of Northwest Territories; **618, 620.**

**Mackenzie, Compton** (born 1883). Eng. novelist and playwright ('Plasher's Mead'; 'Sinister Street'; 'Sylvia Scarlett'; 'Poor Relations'; 'Carnival').

**Mackenzie, William Lyon** (1795–1861), Canadian politician and journalist, **2102.**

**Mackenzie, district of,** Canada, **2528,** *map,* **602–3.**

**Mackenzie River, 2102, 2528;** oil sands, **610, 2102;** water route, **604.**

**Mack'erel,** a N. Atlantic food fish, **2102, 1278;** fisheries, **1284–5.**

**Mackerel family,** the *Scombridae,* a large and important family of spiny-finned fish with spindle-shaped bodies; includes albacore, **3553;** bonito, **3553;** mackerel, **2102;** tunny or tuna-fish, **3552–3.**

**Mackinac** (*mäk'i-nȧ*), **Straits of,** 4 mi. wide connecting Lakes Michigan and Huron, **2226, 2227, 1704.**

**Mackinac Island,** summer resort, **1512–3,** *map,* **1511.**

**McKinley, William** (1843–1901), 25th president of the U.S., **2103–5, 3606;** draws tariff bill, **1592, 2103–4;** memorial at Columbus, Ohio, *picture,* **2571.**—*Administration,* **2104–5;** Marconi perfects wireless, **3760;** Span.-Amer. War, **3306–7, 1000–1;** Hawaii annexed, **3606, 1605;** Samoan Isls. divided with Germany, **3120;** Philippine insurrection, **2770;** Taft's administration of Philippine Isls., **3428;** first Hague Peace Conference, **1559;** Boxer uprising, **748;** assassinated, **2104, 527.**

**McKinley, Mt.,** Alaska (20,464 ft.), **2103, 2515, 77,** *picture-map,* **75.**

**McKinley Tariff Act, 2103–4, 1592, 3437, 790.**

**Mackintosh, Sir James** (1765–1832), Eng. philosopher, lecturer, and lawyer; first gained attention by his brilliant 'Vindiciae Gallicae', **540.**

**MacLar'en, Ian.** Pen name of Rev. John Watson (1850–1907), Scotch clergyman and author ('Beside the Bonny Briar Bush', one of earliest and most popular of "kailyard school" novels).

**McLoughlin** (*mäk-lŏĸ'lin*), **Dr. John** (1784–1857), Canadian explorer and fur trader, chief founder of Oregon, **2597–8.**

**MacMahon** (*mäk-mä-ôn'*), **Marie Edmé Patrice Maurice de** (1808–93). Duke of Magenta and marshal of France; crushingly defeated at Sedan 1870; as 2d president of republic (1873–79) pursued reactionary policy, not sustained by people; resigned.

**McMaster, John Bach** (born 1852). Amer. historian, b. Brooklyn; professor of Amer. history at U. of Pennsylvania since 1883 ('History of the People of the United States').

**McMaster University,** at Toronto, Ont.; Bapt. in origin but now nonsectarian; co-ed.; chartered 1887; arts, theology; **3517.**

**MacMonnies** (*măk-mŭn'nĭz*), **Frederick** (born 1863), Amer. sculptor, b. Brooklyn; among chief works are great fountain in Court of Honor at Columbian Exposition in Chicago, Nathan Hale statue in New York, and Battle Monument at West Point; doors of Congressional Library, **3683**; work characterized, **3164**.

**MacMurrough, Dermot.** *See in Index* **Dermot MacMurrough.**

**MacNeil, Hermon Atkins** (born 1866), Amer. sculptor, b. Chelsea, Mass.; especially noted for treatment of Indian subjects; McKinley memorial at Columbus, *picture*, **2571**.

**Macomb'**, Ill. City 59 mi. n.e. of Quincy; pop. 6714; clay and foundry products; Western Illinois State Normal School.

**Ma'con,** Ga., in center on Ocmulgee R., rapidly growing mfg. city with large cotton, lumber, and flour mills; pop. 52,995; market for cotton and fruit; **1432**.

**Macpherson** (*măk-fẽr'sŏn*), **James** (1736–96), Scotch author, professed "translator" (now generally believed author) of the poems of Ossian, **1166**.

**McPherson, James B.** (1828–64). Amer. Civil War general, b. Sandusky, Ohio; commanded army of Tenn. during Sherman's Atlanta campaign; killed in battle before Atlanta.

**Macquarie** (*mȧ-kwąr'ĭ*) **Island,** 20 mi. long, s.w. of New Zealand, *map*, **2624–5**; penguins, *picture*, **2864**.

**Macrame** (*măk-rȧ-mȧ'*) **lace, 1950.**

**Macready** (*mȧ-krā'dĭ*), **William Charles** (1793–1873). Celebrated Eng. tragic actor.

**Macrochi'res,** order of long-winged land birds, **412,** *picture*, **416.**

**Macropod'idae,** the kangaroo family of animals, **1908.**

**MacSwin'ey, Terence** (1879–1920). Lord mayor of Cork, hunger striker against imprisonment for sedition; died of starvation in Brixton prison, London.

**Mactan** (*măk-tăn'*), small isl. of the Philippines, off e. coast of Cebu; Magellan killed at, **2116.**

**MacVeagh** (*măk-vā'*), **Franklin** (born 1837). Amer. merchant and political leader, b. Chester County, Pa.; sec. of the treasury under Taft (1908–12).

**MacVeagh, Wayne** (1833–1917). Amer. lawyer and political leader, brother of Franklin; minister to Turkey 1870–71; U.S. atty.-gen. 1881; ambassador to Italy 1893–97; a famous wit and vigorous writer.

**Macy, Mrs. John A.,** teacher of Helen Keller, **1916.**

**Mad,** river in Ohio, 100 mi. long, **970.**

**Madagas'car,** isl. in Indian Ocean, off e. coast of Africa; 228,000 sq. mi.; pop. 3,546,000; **2105–6,** *map*, **40–1**; lemurs, **1986.**

**'Madame Butterfly',** opera by Puccini **2584.**

**"Madame Deficit," 2148.**

**"Madame Veto," 2148.**

**Madder family** of herbs, **3943**; red dye from (now superseded by alizarin), **1050.**

**Madeira** (*mȧ-dē'rȧ*), isl. group off coast of Africa, 314 sq. mi.; pop. 170,000; **2106**; govt., **2891**; Portugal colonizes, **2888.**

**Madeira River,** largest tributary of Amazon; flows n.e. 900 mi. from frontier of Bolivia through w. Brazil; *map*, **494.**

**Madeleine** (*mäd-lăn'*), church in Paris, *picture*, **2682.**

**Madero** (*mä-dā'rō*), **Francisco** (1873–1913), president of Mexico, **2217.**

**"Mad Hatter,"** in 'Alice in Wonderland', **648–50.**

**Mad'ison, Dorothea Payne Todd** (1772–1849), charming and popular wife of Pres. Madison; widow of John Todd, a Philadelphia lawyer; **2106, 2107, 3672.**

**Madison, James** (1751–1836), 4th president of U.S., **2106–8**; early life, **2106–7**; helps frame U.S. Constitution, **2107.** — *Administration*, **2107–8, 3604**; battle of Tippecanoe, **1594, 3452**; Creek Indian uprising, **1772, 1856**; War of 1812, **3670–3** (*see also in Index* **War of 1812**).

**Madison,** Wis., state cap. and attractive summer resort in s. center, 75 mi. w. of Milwaukee; pop. 38,378; varied mfrs.; **3772**; capitol, *picture*, **3769**; state univ., *picture*, **3773.**

**Madison River,** one of headstreams of the Missouri, 230 mi. long; rises in Rocky Mts.; **2273.**

**Madon'na,** the Virgin Mary, in religion and art, **2108**; Murillo's 'Immaculate Conception', **2372,** *picture*, **2371**; Raphael, **2976, 2108**; Titian's 'Assumption of the Madonna', *picture*, **3505.**

**'Madonna, Sistine',** painting by Raphael, **2976, 2108,** *picture*, **2635.**

**Madonna lily, 2008, 2009.**

**'Madonna of the Chair',** painting by Raphael, **2976, 2108,** *picture*, **2109.**

**Madras',** a presidency or province of India; 142,330 sq. mi.; pop. 41,500,000; **2108, 1746, 1596.**

**Madras,** India, cap. of Madras presidency; pop. 520,000; **2108, 2110**; captured by French, **795.**

**Madras cloth, 2110.**

**Madrepore** (*măd'rē-pōr*) **coral,** *picture*, **885.**

**Madrid',** cap. and railway center of Spain; pop. 650,000; **2110–1,** *picture*, **3304.**

**Madrid, University of,** largest in Spain and one of the leading institutions of Europe; founded 1508, but did not become real univ. until 1836, when the U. of Alcala was moved to Madrid and combined with it; most of the students are under the medical and law faculties; **2111.**

**Madura** (*mȧ-dų'rȧ*), city in s. India, 270 mi. s.w. of Madras; pop. 134,000; fine Hindu architecture; **1746.**

**Madura.** Isl. in Dutch E. Indies n. of e. Java; 1725 sq. mi.; pop. 2,000,000; numerous hot springs and a mud volcano; isl. is a plateau-like prolongation of the n. Java limestone range.

**Maecenas** (*mē-sē'nȧs*), **Gaius** (73?–8 B.C.), wealthy Rom. patron of Horace and Vergil; name proverbial as that of liberal patron of letters; in Eugene Field's slang phrase, "Maecenas pays the freight"; **3630,** *picture*, **3041.**

**Maelstrom** (*māl'strŏm*) or **Malström,** celebrated whirlpool or current n. of Norway, near s.w. end of Lofoten Isls., **3733, 2532**; in Niagara R., **2502.**

**Maentwrog,** village in Wales, *picture*, **3664.**

**Maestricht** (*mäs'trĭĸt*). City on Meuse R. in extreme s. of Netherlands on Belgian frontier; pop. 41,000; great sandstone quarries, worked since Rom. times; makes beer, brandy, cigars, glass, earthenware.

**Maeterlinck** (*mä'tẽr-lĭnk*), **Maurice** (born 1862), Belgian dramatist and essayist, **2111**; dramas, **1036**; Nobel prize, **2513**; quoted, on bees, **359**, on Ghent, **1456**; 'Story of the Bluebird', **2112–5.**

**Mafeking** (*mä'fĕ-kĭng*), town in Cape of Good Hope province, S. Africa; trading center for w. Transvaal and Bechuanaland; English under Baden-Powell besieged Oct. 12, 1899—May 17, 1900; **447.**

**Mafia** (*mä'fĭ-ä*), a powerful Sicilian secret organization, **3230, 1840**; controversy between U.S. and Italy, **1593.**

**Magazines,** periodicals, **2475**; origin, **1165.**

**Magazines,** of linotype, **2020, 2022, 2023.**

**Magdalena** (*mäg-dä-lā'nä*), r. of Colombia, S. Amer.; rises in Andes in s.w., flows n. 1000 mi. to Caribbean at Barranquilla; chief route to interior; **835, 836,** *map*, **835.**

**Magdalena Bay,** on s.w. coast of Lower California, Mexico, **587,** *map*, **2209.**

**Magdalen** (*mąd'lĭn*) (St. Mary Magdalen) **College,** Oxford; founded, **2610**; tower, *picture*, **2608.**

**Magdeburg** (*mäg'dē-bŭrĸ*), Germany, city on Elbe R., 75 mi. s.w. of Berlin; pop. 286,000; sugar, textile, machinery mfrs.; **1107**; destroyed in Thirty Years' War, **1553–4.**

**"Magdeburg hemispheres," 1117.**

**Magel'lan, Ferdinand** (Fernão de Magalhães) (1480?–1521), Portuguese navigator, **2115–6, 2623, 109,** *pictures*, **1061, 2116**; discoveries, **2692, 1545, 2116**; voyages, *map*, **110, 2115.**

**Magellan, Strait of,** passage between mainland of S. Amer. and Tierra del Fuego, **3285**; discovered by Magellan, **2115, 2116, 109,** *maps*, **3288–9.**

**Magenta** (*mȧ-ġĕn'tȧ*), town in n. Italy 15 mi. w. of Milan; battle of, **1837.**

**Maggiore** (*mäd-ġō'rā*), **Lake,** in Switzerland and n. Italy, 83 sq. mi.; famous for scenery; **3414,** *maps*, **3415, 1836,** *pictures*, **1835, 1193.**

**Mag'got,** a fly larva, **1964, 1312,** *picture*, **1313.**

**Magi** (*mā'ġī*), priestly and learned caste of anc. Medes and Persians, **3842, 2735**; pay homage to Jesus, **1887.**

**Mag'ic, 2117–21**; derived from Magi, **3842**; forms, **2117–20**; modern conjuring, **2120–1**; in India, *pictures*, **1747, 1750**; among N. Amer. Indians, **1771**; origin, **2117**; among Pacific islanders, **2621**; in treatment of disease, **2193**; tricks explained by hypnotism, **1718**; witchcraft, **3773–4.** *See also in Index* **Superstitions.**

**'Magic Flute, The', 2363.**

**Magic lantern, 3353–4.**

**Mag'na Car'ta,** charter of Eng. liberties, **2121, 1896, 1153, 1633**; preserved in British Museum, **1198.**

**Magna Grae'cia,** in anc. geography, name given to Gk. settlements in s. Italy and Sicily, **1520, 3044,** *map*, **1518.**

**Magna'lium,** alloy of aluminum, **104.**

**Magne'sia,** or magnesium oxide. A white powdery substance obtained by burning magnesium or magnesium salts.

**Magnesia, battle of** (190 B.C.), decisive victory of Romans over Antiochus the Great at anc. town of Magnesia, Asia Minor, 20 mi. n.e. of Smyrna, **1657.**

**Magnesia, milk of,** milky solution of magnesium hydroxide in water, **2121.**

**Magne'sium,** a silver-white metallic element, **2121, 4042**; in alloys, **104**; amount in earth's crust, **711,** *picture*, **1058**; in bones, **452**; discovered by Faraday, **1224**; in flashlight powder, **2783**; in glass-making, **1472**; makes water "hard," **3696**; in meerschaum, **2194**; needed by plants, *picture*, **2821**; phosphate, **452**; in protoplasm, **394**; in talc, **3430**; silicate, **2194, 3430.**

**Mag'net and magnetism, 2121–3, 2786, 4037**; attraction by electrified bodies, **1108, 1110**; aurora borealis

affects earth's magnetism, **259**; cathode rays deflected, **3824**; in compasses, **853–4**; development of knowledge, **1117, 1121, 1122**; electric current creates magnetic force, **1113**; electromagnets, **1113, 2121–2, 1121**; magnetic field, *pictures*, **2123, 1051**; in motors, **1124, 1125**.

**Magnet'ic compass, 853–4.**

**Magnetic detector,** in radio, **3761.**

**Magnetic deviation,** deflection of compass needle caused by nearby metal, **854.** *See in Index* **Magnetic variation.**

**Magnetic dip, 4037.**

**Magnetic Equator.** Same as **Aclinic Line.**

**Magnetic field,** space through which a magnet exercises magnetic influence, considered as composed of "lines of magnetic force," *picture*, **2123, 1051**; electric current induced, *picture*, **1051.**

**Magnetic pole,** point on a magnet where its magnetic powers are strongest, **2122–3.**

**Magnetic poles,** of earth, points near the n. and s. geographic poles toward which lines of earth's magnetism converge, **1064,** *picture*, **855**; n. magnetic pole, **2860, 120, 1690**; positions change, **1064, 120**; s. magnetic pole, **2863.**

**Magnetic variation,** deflection of compass needle from true north, due to difference in position of magnetic and geographic poles, **854,** *picture*, **855.** *See in Index* **Magnetic deviation.**

**Mag'netite** or **lodestone,** a black iron ore ($Fe_3O_4$) with magnetic properties, **1817, 2122**; Pa. deposits, **2720.**

**Magne'to,** small dynamo with steel field-magnets, **1052.**

**Magnetom'eter.** An instrument for measuring the strength, direction, dip, or all three, of the earth's magnetic field at any point.

**Magnificent bird of paradise,** color plate, **2676–7.**

**Mag'nifying glass,** convex enlarging lens, **1986–7.**

**Magnitudes of stars, 3342.**

**Magno'lia,** a flowering tree, **2123–4**; classified, **3533.**

**Magnolia'ceae,** the magnolia family of plants, with triple petals and sepals, **3941**; includes magnolias, **2123–4**; tulip trees, **3548.**

**Ma'gog,** Quebec. Town at n. end of L. Memphremagog, about 75 mi. e. of Montreal; pop. 5500; saw mills, textile works, creameries, bobbin factory; fishing resort.

**Mag'ot monkey, 2292.**

**Magpies, jackdaws, and rooks, 2124.**

**Maguey** (*mä-gwā'*) **plant,** or agave, **42, 2213,** *picture*, **2215.**

**Magyaria** (*mạd-yạr'i-ȧ*), or Hungary, **1702–4.**

**Magyar** or **Hungarian language, 1702–3.**

**Magyars** (*mạd'yạrs*), a Finno-Ugric race appearing in Europe in 9th cent.; dominant race of Hungary; **1702–4, 271**; in Budapest, **524**; in Czecho-Slovakia, **948**; defeated by Otto I (955), **2606**; defeated by Turks (1526), **3559**; related peoples, **1248, 3557**; Rev. of 1848, **1945, 273, 1354**; in Rumania, **3081, 3082.**

**Mahabharata** (*mä-hä-bä'rȧ-tȧ*), Hindu epic, **1755.**

**Mahaf'fy, Sir John Pentland** (1839–1919). Irish scholar, Gk. and Rom. historian ('Social Life in Greece from Homer to Menander'; 'Silver Age of the Greek World').

**Mahan** (*mȧ-hăn'*), **Alfred Thayer** (1840–1914). Amer. naval officer and author, b. West Point, N.Y. ('The Influence of Sea Power upon History', authoritative work, first on subject); quoted, **2422.**

**Mahanoy' City,** Pa. Industrial borough 55 mi. n.e. of Harrisburg in anthracite coal-mining region; pop. 15,599; foundry products, wagons, hosiery, etc.; fire-clay and building stone near by.

**Mahdi** (*mä'di*), the Mohammedan Messiah; various pretenders have claimed the title; the Sunnites hold that the true Mahdi has not yet appeared; name given particularly to Mohammed Ahmed (1843–85), **1489.**

**Mahé** (*mä-ā'*), Fr. settlement on Malabar coast, India; 26 sq. mi.; pop. 12,000; **1756.**

**Mahmud** (*mä-mụd'*) **II** (1785–1839). Sultan of Turkey, succeeded 1808; suppressed janissaries; forced to recognize independence of Greece.

**Mahmud of Ghazni** (971–1030), Afghan conqueror, sultan of Ghazni 997–1030; numerous invasions of India, commencing in his youth under the leadership of his father Sabuktigin; establishes rule over India, **1752.**

**Mahog'any, 2124–5**; in furniture-making, **1384, 1385**; Mexican export, **2213**; mill at New Orleans, **2469**; name given to eucalyptus, **1187, 2125**; veneer, **3620.**

**Mahom'et.** Same as **Mohammed.**

**Maho'ning River,** rises in e. Ohio, flows s.e. in Pa. joining Shenango R. to form Beaver; length 100 mi.; at Youngstown, Ohio, **3832.**

**Mahout',** elephant driver, **1127.**

**Mahrattas** (*mä-rät'ȧs*), Hindu tribes of cent. and w. India; conquered and ruled many states, forming a powerful confederacy 17th and 18th cents.; **1752, 1753, 1596**; Wellington crushes, **3717.**

**Maia** (*mā'ȧ*), in Gk. myth., mother of Hermes, **1644.**

**Maidenhair fern, 1234.**

**Maid of Orleans.** Name for Joan of Arc.

**Maidstone,** England. County town of Kent; pop. 34,000; on Medway R., 30 mi. s.e. of London; grain market; Kentish Royalists defeated by Fairfax 1648.

**Maidus** (*mī'dụz*), tribe of "digger" Indians formerly living along upper Sacramento R., in n. Calif., **1767.**

**Mail matter,** classes in U.S., **2898.**

**Maimonides** (*mī-mŏn'ī-dēz*) or **Moses ben Maimon** (1135–1204), Jewish rabbi and philosopher, **1625.**

**Main,** r. in s. Germany formed by Red and White Main; has tortuous course w. for 310 mi., joining Rhine opposite Mainz; canal to Danube R., **961**; at Frankfort, **1357.**

**Maine,** old province in n.w. France, s. of Normandy; chief city, Le Mans; *map*, **1351**; united with English crown, **1633.**

**Maine,** northernmost of New England states; 33,040 sq. mi.; pop. 768,014; cap. Augusta; **2125–9,** *maps*, **2126, 3584–5**; chief cities, **2125, 2126, 2128**; origin of name, **3347**; physical features, **2125, 2126**; products and industries, **2126–8, 1285, 439**; state flower, **3347.** — *History*, **2128–9, 2170**; Aroostook War, **3617, 3153**; in Missouri Compromise, **2273**; prohibition, **2920.**

**'Maine',** U.S. battleship, **3306, 2104.**

**Maine, University of,** at Orono, Me.; co-ed. state institution founded 1862 (opened 1868); arts and sciences, agriculture, technology, law; **2128.**

**Mainland,** one of Orkney Isls., **2601.**

**Mainland,** one of Shetland Isls., **3206.**

**Maintenon** (*măn-tē-nôn'*), **Marquise de** (1635–1719), 2d wife of Louis XIV, **2129.**

**Mainz** (*mīnts*), commercial and mfg. city and fortress in s.w. Germany on Rhine R. opposite mouth of Main; pop. 108,000; head of league of Rhenish towns in 13th cent.; **3006, 1442**; center for early printing, **2916**; in Thirty Years' War, **1554**; in World War, **3808.**

**Maipo** (*mī'pọ*) or **Maipu.** River of Chile; rises in Andes, flows 120 mi. w. to Pacific just s. of Santiago; decisive battle of Chilean War for independence fought on banks (1818).

**Mair, Charles** (born 1838). Canadian poet and journalist, remembered for 'Tecumseh', a poetic drama revealing insight into Indian character.

**Maisonneuve** (*mā-zôn-nûv'*), Quebec. Mfg. city and port within territorial limits of Montreal; pop. 40,000; cans, cotton goods, licorice, shoes; dry dock and govt. navy yard.

**Maitland, Frederick William** (1850–1906), Eng. jurist and historian ('History of English Law', 'Canon Law in England'); notable alike for sweetness of character, acuteness in criticism, and wisdom in counsel; teacher of Smuts, **3254.**

**Maize.** *See in Index* **Corn.**

**Majol'ica pottery, 2906.**

**Major,** in army, rank appropriate to command of a battalion or squadron; in infantry organization, **218**; U.S. Army insignia, **3576.**

**Majorca** (*mȧ-jôr'kȧ*) (Span. **Mallorca),** largest of Balearic Isls. (Spanish); 1330 sq. mi.; pop. 264,000; cap. Palma; **307,** *map*, **3300.**

**Major-general,** in U.S. Army, **218**; insignia, **3576.**

**Majority,** in election, **1107–8.**

**Majuba** (*mȧ-jụ'bȧ*), hill in extreme n.w. of Natal, S. Africa, where Boers defeated British 1881; battle, **446, 3280.**

**"Make the worse appear the better cause," 3005.**

**Makino, Viscount** (born 1861), Japanese statesman and diplomat; minister to Italy (1899), and to Vienna during Russo-Japanese War; minister of education (1906–08), of agriculture and commerce (1911–12), of foreign affairs (1913–14); **3808.**

**Malabar** (*măl'ȧ-bär*) **Coast,** name often given to w. coast of India as far n. as Bombay; properly confined to s. part; scene of Mohammedan revolt 1921–22; **1744, 1756.**

**Malabar Hill,** Bombay, **451.**

**Malabar squirrel,** *picture*, **3334.**

**Malacca** (*mȧ-lăk'ȧ*), Brit. territory on w. coast of Malay Peninsula between Singapore and Penang; 700 sq. mi.; pop. 715,000; **2131, 2130.**

**Malacca, Strait of,** channel between Sumatra and w. coast of Malay Peninsula, **2131, 2130, 3243,** *map*, **1072.**

**Malachi** (*măl'ȧ-kī*). The 39th book of the Old Testament and last of the minor prophets, written between 464 and 424 B.C.; authorship disputed.

**Malachite** (*măl'ȧ-kīt*). A bright green copper ore, commonly found massive though occasionally in stalactitic and other forms; it is found in the Ural Mts., in France, and elsewhere; prized as an ornamental stone.

**Malaga** (*măl'ȧ-gȧ*), Spain. Mfg. city and seaport on Mediterranean, 65 mi. n.e. of Gibraltar; pop. 141,000; taken from Moors by Christians 1487; sacked by French 1810; ships wine, grapes, raisins, olives, etc.

**Malaga wine, 3302.**

**Malagasy** (*măl-ȧ-gȧs'ī*), native of Madagascar, **2105–6.**

**Mä'lar, Lake,** Sweden, extends inland from Baltic Sea at Stockholm; 450 sq. mi.; of irregular shape and contains some 1200 isls.; **3403,** *map*, **2531.**

**Malaria,** disease consisting usually of successive chill, fever, and "intermission" or period of normality; cause and prevention, **2334–8, 1450;** in India, **1747;** in Italy, **1838;** in Panama, **2651–4;** quinine a remedy, **2950.**

**Malaspina** (*mä-lä-spē'nä*) **Glacier.** Largest glacier in Alaska, w. of Yakutat Bay; covers 1500 sq. mi. and has front 70 mi. long.

**Malatia** (*mä-lä-tē'ä*), Turkey. Important trade center in e. Asia Minor; pop. 30,000; massacre of Armenians 1895.

**Malay Archipelago, 2129.** *See also in Index* **East Indies.**

**Malayan** or **sun bear, 355.**

**Malay Peninsula, 2129–31,** *maps,* **232–3, 1072;** flying dragons, **2036;** gutta-percha, **1554;** life of natives, **227, 2130;** pig-tailed monkey, *picture,* **2288;** panning tin, *picture,* **3504;** rice-growing, **3015;** rubber, **3072.**

**Malays,** natives of Malay Peninsula and adjacent isls., **2130, 2953;** in Borneo, **468;** Celebes, **671;** Java, **1879;** piracy, **2810;** Siam, **3227.**

**Malay States, 2130.**

**Malden** (*mal'dĕn*), Mass. Mfg. city on Malden R. 4 mi. n. of Boston; pop. 49,103; rubber boots and shoes, shoe lasts and trees, wire cord, leather, cotton goods, hosiery, knit goods.

**Mal'dive Islands.** Group of 13 coral islets in the Indian Ocean s.w. of India; pop. 70,000 (Mohammedan); ruled by a sultan, tributary to Ceylon govt.

**Maldon** (*mal'dŏn*), England. Small port on Blackwater R. 40 mi. n.e. of London; Danish victory over English in 991.

**Malebranche** (*mäl-bränsh'*), **Nicolas** (1638–1715). Fr. philosopher, follower of Descartes.

**Maleo** (*mä'lē-ō*), an Australian bird of the megapod family; head, *picture,* **410.**

**Malherbe** (*mäl-êrb'*), **François de** (1555–1628), Fr. poet and critic, **1364.**

**Malia, Cape,** the s.e. extremity of Morea, the s. peninsula of Greece, **886.**

**Ma'lic acid,** an organic acid found in plant juices; in fruit, **10.**

**Malines** (*mä-lēn'*) or **Mechlin,** Belgium. Mfg. city 14 mi. s. of Antwerp; pop. 60,000; ecclesiastical center; largely destroyed in 1914 by Germans in drive on Antwerp.

**Mall** (*mäl* or *měl*), park in Washington, D.C., **3684.**

**Mal'lard,** a common river duck, **1044,** *pictures,* **1045, 414.**

**Malleabil'ity,** of copper, **881;** gold, **1481,** *picture,* **1482;** silver, **3242.**

**Mal'lee-bird,** an Australian megapod, **1090.**

**Mallophaga** (*mă-lŏf'à-gà*), order of insects including bird-lice, **1788.**

**Mal'low family,** or *Malvaceae,* a family of plants with stamens fused into a central column, **3942;** includes cotton, **906,** hollyhock, **1673.**

**Malmaison** (*mäl-mā-zôn'*) **Castle,** chateau near Paris, home of Empress Josephine, **1901.**

**Malmedy** (*mäl'mĕ-dē*), town and dist. in e. Belgium 25 mi. s.e. of Liége, ceded with Eupen by Germany 1919; *map,* **373.**

**Malmö** (*mäl'mû*), 3d city of Sweden, seaport and industrial center on s. coast; pop. 112,000; ferry to Copenhagen, Denmark; **3403.**

**Malnutrition, 1320;** importance of vitamins, **3651–2.**

**Mal'ory, Sir Thomas** (d. 1470?), translator, compiler, and author (in part) of first notable Eng. prose romance, 'Morte d'Arthur', **223, 1164.**

**Malpighi** (*mäl-pē'gē*), **Marcello** (1628–94), Ital. physiologist, one of the first to apply the microscope to the study of animal and vegetable structure and the first to attempt the anatomy of the brain; demonstrates blood circulation, **438, 2228.**

**Malpighian layer of skin,** *picture,* **1451.**

**Malplaquet** (*mäl-plä-kā'*), France, village near Belg. frontier, scene of Fr. defeat (1709), **2150.**

**Malt, 2131;** chemical nature, **84;** vinegar, **3644.**

**Malta** (*mal'tà*), isl. in Mediterranean, Brit. naval base; 95 sq. mi.; pop. 230,000; **2131;** *map,* **1196–7.**

**Malta, Knights of,** Crusading Order, **2131, 2194.**

**Malta fever, 1614, 2131.**

**Malt'ase,** starch-digesting enzyme of saliva, **1010, 1011.**

**Malted milk, 2239, 2131.**

**Maltese** or **hen pigeon,** *picture,* **2804.**

**Malthus** (*măl'thŭs*), **Thomas Robert** (1766–1834), Eng. economist and author of "Malthusian" theory; influence, **964, 1078.**

**Malthu'sianism.** The theory advanced in Malthus' 'Essay on Population' that population, increasing in geometrical ratio, tends, unless checked, to outrun subsistence, which increases in arithmetical ratio.

**Malt'ose,** a sugar, **3388.**

**Malva'ceae.** *See in Index* **Mallow family.**

**Mal'vern.** Fashionable inland resort in w. England, 7 mi. s.w. of Worcester; pop. 16,000; on e. side of Malvern Hills, which extend n. and s. 9 mi.

**Mal'vern Hill, battle of.** The last of the Seven Days' Battles of the Civil War, July 1, 1862; fought on n. side of James R. 15 mi. s.e. of Richmond; Confederates defeated.

**Mam'elukes, 1107.**

**Mamil'ius, Octavius,** leader of Latin revolt, **3042.**

**Mam'mals,** the **Mammalia,** vertebrate animals which nurse their young, **2132, 3634, 127,** *Study Outline,* **3950–2;** bats, **345–6;** egg-laying types, **1046–7, 1090;** evolutionary position, *diagram,* **128,** *picture,* **129;** evolved from reptiles, **2997, 1209, 3950;** feed on milk, **2238;** feet, **1322–4;** first appearance in geologic time, **1209, 1420;** fossil, **1336;** hair a distinguishing mark, **1559–60;** hands and fore limbs, **1571–2;** hibernation, **1646–7;** marsupials and placentals, **1907–8, 2585;** migrations, **2234;** rodents, **3036;** ruminants, **3082–3;** smallest in America, **2279;** whales and their relatives, **3723–6.**

**Mam'mon.** Riches, or the god of riches and cupidity; term used in the New Testament.

**Mammoth,** a hairy elephant-like animal, now extinct, **2132,** *pictures,* **667, 1126.**

**Mammoth Cave,** Ky., 75 mi. s.w. of Louisville, **664–5,** *map* and *pictures,* **665;** blind crawfish, **916.**

**Mammoth Hot Springs,** Yellowstone National Park, **3830,** *picture,* **3829.**

**Man, 2133–4;** classified in animal kingdom, **2132, 127–8;** brain, **486–92;** early home in Asia, **230, 232;** evolution theory, **1209, 153, 154, 1141;** future possibilities, **2586–7;** history of civilization, **771–4;** laws of heredity, **1642, 1644, 1187;** life influenced by geographic conditions, **1413–5, 2790;** mastery of the earth, **1795–1802;** mind, **2247, 2930–1;** opposable thumb, **1571, 1795, 153;** prehistoric period, **666–70, 3360–1, 2133–4, 1721;** races, **2956–7, 3866–9;** racial heights, **149;** relation to apes, **153, 154;** studied in sociology, **3270, 149;** vertebrate structure, **3244–5, 3634.** *See also in Index* **Anthropology; Archeology; Civilization; Economics; Physiology; Psychology; Sociology;** etc.

**Man, Isle of,** isl. in Irish Sea; pop. 53,000; 227 sq. mi.; **2134,** *map,* **1152–3;** people and language, **674.**

**Management,** as a factor in production of wealth, **1077.**

**Managua** (*mä-nä'gwä*), cap. and 2d city of Nicaragua, Cent. Amer., 30 mi. from Pacific coast; pop. 61,000; on L. Managua, 40 mi. long; **2505.**

**Manama** (*mä-nä'mä*). *See in Index* **Bahrein Islands.**

**Manaos** (*mä-nä'ōs*), city in n.w. Brazil on Rio Negro, 10 mi. from Amazon R.; pop. 81,000; **496.**

**Manas'sas,** Va., village 25 mi. s.w. of Washington on Bull Run Creek; scene of Battle of Bull Run, **533.**

**Manasseh** (*mà-năs'ĕ*). One of Hebrew tribes descended from Manasseh, elder son of Joseph; occupied cent. Palestine e. and w. of Jordan R.

**Manatee',** or sea cow, **2134;** evolutionary position, **128.**

**Manchester,** Conn. Mfg. town with large silk mills 9 mi. n.e. of Hartford; pop. 18,370; cotton and woolen goods, paper, needles, tinware.

**Manchester,** England, seaport and textile mfg. center; pop. 740,000; **2134, 1158.**

**Manchester,** N.H., largest city and most important mfg. center in state, 45 mi. n.w. of Boston; pop. 78,384; **2454, 2456.**

**Manchester Ship Canal, 626, 1578–9, 2134.**

**Manchu' Dynasty,** rulers of China 1644–1912, **746, 742, 2134;** overthrown, **742, 746.**

**Manchuria** (*măn-chụ'rĭ-à*), northeastern part of China; 364,000 sq. mi.; pop. 12,000,000; cap. Mukden; **2134–5, 740, 228,** *maps,* **740, 232–3;** Japanese influence, **748, 1863, 1867, 1870;** Rus. influence, **3098;** sika deer, **981.**

**Manchus,** a Tataric people; conquer China, **746;** legend of origin, **2134.**

**Man'co** (1500?–44), Inca leader, set up by Pizarro as sovereign of Peru, **2814.**

**Mandalay** (*măn'dà-lā*), India, chief town in Upper Burma, on Irrawaddy R.; pop. 140,000; silk mfrs.; **541.**

**Manda'mus** (Latin, "we command"). A writ issued by a superior court ordering an official, corporation, or inferior court to perform a public duty as required by law.

**Man'dans,** tribe of Plains Indians originally living along lower Missouri R.; later driven n. to N.D.; **1767;** Lewis and Clark among, **1989.**

**Man'darin orange,** or tangerine, **2590.**

**Mandarins,** Chinese officials, **746, 2700.**

**Man'datary** or **mandatory territories,** former Ger. colonies and parts of Turkish Empire assigned at close of World War to various powers to be held under mandates (treaties of trust) for League of Nations, **1974, 3812.** These territories (total pop. 13,000,000) were assigned as follows:

To Great Britain: Mesopotamia, Palestine, Nauru Isl., parts of Togo, Cameroon, Tanganyika Territories.

To Union of South Africa: Southwest Africa.

To France: Syria, parts of Togo and Cameroon.

To Belgium: small parts of German East Africa.

To Australia: German New Guinea and adjacent isls.

To New Zealand: German Samoa.

To Japan: all German isls. in Pacific n. of Equator.

To Greece: Smyrna.

**Man'deville, Sir John** (Jehan de Mandeville). Reputed writer of a 14th cent. book of travels written in French.
**Man'dibles,** jaws of insects, **1787,** *pictures,* **1782.**
**Mandin'go.** A large group of negroes mixed with Hamites, dwelling in w. Africa from the Senegal R. to Monrovia and numbering millions; they are Mohammedans and have attained a certain degree of culture under Arab teachers.
**Man'dolin,** stringed musical instrument played by plucking, **2135,** *picture,* **2382.**
**Man'drake** or **mandragora,** a plant of nightshade family, **2135, 2175;** rootstock, **532.**
**Man'drill,** an African baboon, **2292.**
**Man-eating shark, 3196–7.**
**Manet** (*mă-nā'*), **Edouard** (1833–83), Fr. painter, pioneer, and most important master of impressionism; called most original painter of latter 19th cent.; **2633.**
**Man'etho.** Egypt. historian of 3d cent. B.C.; fragments of his work survive in Josephus.
**Manfredo'nia, Gulf of,** on e. coast of Italy, **1835.**
**Mangabey** (*măn'gà-bā*) **monkey,** *picture,* **2288.**
**Man'gan, James Clarence** (1803–49), Irish poet ('Romances and Ballads of Ireland'; 'The Nameless One', an autobiographical ballad); a morbid genius who sincerely expressed the tragedy of Irish aspirations; **1814.**
**Manganese** (*măn-gà-nēs'*), a metallic element, **2135;** used in alloys, **99, 2507, 2135;** in glass mfr., **1472;** sources, **2135, 3087, 736, 937, 2210.**
**Man'gel** or **mangel-wurzel, 365.**
**Mangin** (*măn-zhăn'*), **Charles Marie Emmanuel,** Fr. general (author 'Comment finit la Guerre', a masterly review of the World War); served many years in Sudan, Morocco, and other Fr. colonies; in World War was corps commander at Verdun 1916; VI. Army commander in Aisne offensive 1917; at second battle of Marne, **2151.**
**Man'go,** a fruit, **2135, 2130, 3227;** stuffed pepper, **2723.**
**Man'gosteen,** a tropical fruit, **1378, 2130, 3227.**
**Mangrove,** a tree, **2135, 1976, 33.**
**Manhat'tan Beach,** N.Y., **857.**
**Manhattan Borough,** part of New York City, Manhattan and several small adjacent isls., **2498.**
**Manhattan College.** At New York City; men; Rom. Cath. (Christian Brothers); incorporated as college 1853 (Academy of the Holy Name, 1849); arts and sciences, civil engineering.
**Manhattan Island,** in New York City, **2487, 2489, 2496,** *map,* **2488.**
**Manil'a,** cap. of Philippine Isls.; pop. 285,000; **2136, 2765,** *picture,* **2768;** cable, **561.**
**Manila Bay,** Philippine Isls., large inlet of China Sea in isl. of Luzon; excellent fortified harbor; **2136.**
**Manila Bay, battle of, 1000–1, 3307.**
**Manila coffee, 824.**
**Manila hemp, 1630, 2768–9;** made into rope and twine, **3063–5, 325.**
**Manila paper, 2667.**
**Manil'ius, Gaius.** Rom. tribune of the people in 66 B.C., whose proposal to give Pompey supreme command and unlimited power in the war against Mithridates was supported by Cicero in the famous oration 'Pro lege Manilia'.
**Man in the Iron Mask, The, 1827.**
**Manioc** (*măn'ĭ-ŏk*), or cassava, plant from which tapioca is obtained, **3434, 37.**
**Manis'sa** or **Manisa.** City in w. Asia Minor 20 mi. n.e. of Smyrna; pop. 35,000; anc. Magnesia, where Rom. consul Scipio Asiaticus defeated Antiochus the Great 190 B.C.
**Manistee',** Mich. Shipping port on Manistee R. and L. Michigan, 95 mi. n.w. of Grand Rapids; pop. 9694; large salt plant and lumber interests; pulp, leather, vacuum pans.
**Manito'ba,** prairie province of Canada; 251,832 sq. mi.; pop. 620,000; **2136–7,** *map,* **602–3;** L. Agassiz, **1721, 2136;** prairies, **602;** Red R., **2986;** Red R. Rebellion, **2986, 2137;** cap. Winnipeg, **3752,** *picture,* **609.**
**Manitoba, Lake,** in s.-cent. Manitoba, Canada; length 110 mi.; drains into L. Winnipeg through Dauphin R.; **2137,** *map,* **602–3.**
**Manitoba, University of.** At Winnipeg, Manitoba; co-ed.; established 1877; arts and science, engineering, medicine, pharmacy, law; Manitoba Agricultural College; several affiliated denominational colleges.
**Manitou** (*măn'ĭ-tụ*), Indian name for spirit or supernatural being, **1771.**
**Manitou** or **Manitou Springs,** Colo., health and pleasure resort at foot of Pikes Peak; pop. 1129; Garden of the Gods and Cave of the Winds near by; medicinal springs, **845.**
**Manitou'lin,** rugged isl. in Georgian Bay, 80 mi. long, **1705.**
**Manitowoc',** Wis., industrial city and port on L. Michigan, 74 mi. n. of Milwaukee; pop. 17,563; aluminum, boilers, engines, knit goods, furniture, clay products; large shipbuilding yards; car ferry, **2227.**
**Manka'to,** Minn. City with large stone-quarrying interests, 72 mi. s.w. of St. Paul on Minnesota and Blue Earth rivers; pop. 12,469; threatened by Sioux uprising 1862.
**Mann, Horace** (1796–1859). Amer. educator and publicist, b. Franklin, Mass.; revolutionized Mass. school system, and indirectly laid foundation for free public school systems in almost all other states; succeeded J. Q. Adams in House of Representatives (1848–53); first president of Antioch College.
**Man'na.** In Bible, the food on which the Israelites lived in the wilderness; said to have rained from Heaven (Exod. xvi).
**Manna gum,** a eucalyptus tree, **1187.**
**'Manners, Good',** a Little Talk by Arthur Mee, **1182.**
**Mannheim** (*măn'hīm*), in Baden, s.w. Germany, chief commercial city on upper Rhine R.; pop. 230,000; grand ducal palace covers 15 acres; makes farm machinery, gasoline and electric motors; **303.**
**Manning, Henry Edward, Cardinal** (1808–92). Eng. High Church leader; became Rom. Cath. 1851, and cardinal 1875; ardent supporter of doctrine of papal infallibility.
**Mano'rial system,** of agriculture, **433.**
**Man o' War,** famous horse, *picture,* **1685.**
**Man-o'-war bird,** or frigate-bird, **1372.**
**Manselka Mts.,** Finland, **1248.**
**Mansfield, Richard** (1857–1907). Amer. actor, b. Berlin, Germany; ('Dr. Jekyll and Mr. Hyde'; Shakespearean rôles).
**Mansfield,** Ohio. Industrial city 65 mi. s.w. of Cleveland; pop. 27,824; steel and brass goods, machinery, engines, auto tires; large trade in farm products.
**"Man's first disobedience," 2244.**
**Manship, Paul** (born 1885), Amer. sculptor, b. St. Paul, Minn.; memorial tablet to J. P. Morgan; **3164.**
**Mansion House,** London, residence of lord-mayor, **2052.**
**Manson, Sir Patrick** (born 1844), Eng. physician and writer on tropical diseases, **2653.**
**Mansurah** (*măn-sụ'rä*), Egypt. Town on Nile delta 70 mi. n. of Cairo; pop. 50,000; cotton trade and mfrs.; battle between Crusaders under Louis IX of France and Egyptians 1250; Louis imprisoned.
**Mantegna** (*măn-tā'nyä*), **Andrea** (1431–1506), Ital. painter ('Triumph of Caesar'; 'Madonna della Vittoria'); influence on painting, **2629.**
**Man'tell, Robert (Bruce)** (born 1854). Amer. actor, b. in Scotland; especially noted for Shakespearean roles ('Hamlet'; 'The Merchant of Venice'; 'Richelieu').
**Mantinea** (*măn-tĭ-nē'à*), **battle of** (362 B.C.), between Thebes and Sparta, **3486, 1525.**
**Man'tis,** an insect, **2137.**
**Mantle,** the shell-forming tissue of mollusks, **2280, 3201;** in nautilus, **2418;** of octopus, **943;** in oyster, **2614,** *picture,* **2615;** of squid, **941–2.**
**Mantua** (*măn'chụ-à*) (Ital. **Mantova**), fortified town in n. Italy 80 mi. s.w. of Venice; pop. 35,000; home of Vergil; held by French 1797–99, 1801–14, by Austria, 1814–66; **2393.**
**Man'u,** the "Adam" of Hindu myth.; also traditional author of anc. Hindu lawbook, **2086.**
**Man'ual,** organ, **2598, 2600.**
**Manuel** (*măn'yụ-ĕl*) **II** (born 1889), king of Portugal, succeeded 1908; deposed and banished 1910 when Portugal became a republic, **2026;** palace, *picture,* **2888.**
**Manufac'tures,** greatest in U.S., **3590,** *picture,* **3589.** For detailed references on the world's leading manufactures *see* Study Outline, **4020.** *See also in Index* under names of political divisions.
**Manure',** as a fertilizer, **1235.**
**Man'uscripts, 455–6;** anc. papyrus, *picture,* **388;** of Bible, **390;** famous collections, **1992, 2056, 2073, 3055;** in medieval monasteries, **2300,** *pictures,* **2710, 456;** palimpsests, **390;** parchment used, **2667;** pen, **2709;** styles of writing, **3817.** *See also in Index* **Books and bookmaking.**
**Manutius** (*mă-nū'shĭ-ŭs*), Ital. family of printers, who flourished during 16th cent.; their press called Aldine, from Aldus, the founder; Aldus, **456, 2936.**
**'Man Without a Country, The',** story retold, **1562–5.**
**Manx,** a Celtic language, **1814, 674, 2134.**
**Manx cat,** tailless species of Isle of Man, **658.**
**Manzanillo** (*măn-sä-nēl'yō*), Cuba. Seaport on Caribbean Sea; pop. 57,000; exports sugar and tobacco.
**Manzanillo,** Mexico. Port on Pacific coast; pop. 2000; comparatively recent development; r.r. connection with interior; growing foreign trade.
**Manzoni** (*măn-dzō'nē*), **Alessandro** (1785–1873), Ital. poet and novelist 'I Promessi Sposi', called "best historical novel ever written"), **1833, 2541.**
**Maoris** (*mä'ō-rĭz*), the aboriginal people of New Zealand, **2499.**
**Ma'ple, 2138–42;** autumn coloration, **3537;** flowers, **3534;** leaf, **3535,** *picture,* **2138;** a polypetalous tree, **3533;** seeds, **3537, 3172,** *pictures,* **3172, 2138;** story, 'Life in a Maple Sugar Camp', **2138–42.**
**"Maple Leaf, Land of the," 601.**
**'Maple Leaf Forever, The',** Canadian song, **2405.**
**Mapo'cho River,** Chile, 75 mi. long, stream of cent. Chile, tributary to Maipo, **3125.**
**Maps:** Abyssinia, **3;** Aegean Sea and neighboring regions, **27;** Afghanistan, **31;** Africa, **40–1;** Alabama, **72;** Alaska, **75;** Aleutian Isls., **79;** Algeria, **97;** Amazon River basin, **105;** America (explorations),

**110**; Arabia, **165**; Arctic explorations, **189**; Argentina, **191**; Arizona, **201**; Arkansas, **208**; Asia, **232–3**; Atlantic traffic routes, **255**; Australia, **262, 264–5**; Austria-Hungary, **271**; Assyrian and Babylonian empires, **298**; Balkan Peninsula, **308**; Belgium and Netherlands, **373**; Black Sea region, **434**; Brazil, **494**; British Empire, **514**; British Isles, **1152–3, 1159**; California, **577, 578**; Canada, **602–3, 616**; Central America, **680**; China, **740**; Colombia, **835**; Colorado, **840**; Congo State, **859**; Connecticut, **864**; Cuba, **938**; Czecho-Slovak Republic, **947**; Delaware, **988**; Denmark, **997**; East Africa, **1069**; East Indies, **1072–3**; Egypt, (modern) **1095**, (anc.) **1100**; Europe, **1190–1, 1196–7**; Florida, **1297, 1298**; France, **1351**; Georgia, **1432**; Germany, **1440**; Great Lakes, **1511**; Greece (anc.), **1518**; Greenland, **1540**; Guiana, **1547**; Idaho, **1726**; Illinois, **1731**; India, **1744, 1745**; Indiana, **1758**; Iowa, **1804**; Italy, **1836**; Japan, **1864**; Kansas, **1910**; Kentucky, **1917**; Louisiana, **2070**; Maine, **2126**; Marne, first battle of, **2150**; Maryland, **2162**; Massachusetts, **2166**; Mexico, **2209**; Michigan, **2226**; Minnesota, **2254**; Mississippi, **2262**; Missouri, **2270**; Montana, **2309**; Nebraska, **2429**; Nevada, **2445**; New Hampshire, **2454**; New Jersey, **2458**; New Mexico, **2465**; New York state, **2480**; New York City, **2488**; North America, **2514–5**; North Carolina, **2518**; North Dakota, **2524**; Northern Hemisphere, **1414–5**; Ohio, **2568**; Oklahoma, **2574**; Oregon, **2596**; Pacific Ocean, **2624–5**; Panama, Isthmus of, **2662**; Pennsylvania, **2718**; Peru, **2744**; Philippine Islands, **2768**; Poland, **2858**; Polar regions and Amundsen's voyages, **120**; Prussia (historical), **2929**; Rhode Island, **3009**; Roman Empire, **3042**; St. Mihiel salient, **3802–3**; Scandinavian peninsula, **2531**; South Africa, **3282**; South America, **3288–9**; South Carolina, **3291**; South Dakota, **3296**; Spain, **3300**; Switzerland, **3415**; Tennessee, **3468**; Texas, **3474, 3478**; standard time map of world, **3502**; United States, (political) **3584–5**, (exploration and annexation) **3605**, (national parks) **2400**; Uruguay and Paraguay, **3608**; Utah, **3610**; Venezuela, **3622**; Virginia, **3650**; Washington, **3687**; West Virginia, **3722**; Wisconsin, **3770**; world circumnavigated, **2115**; world rainfall, **2973**; world's petroleum fields, **2752**; Wyoming, **3820**.

**Maps and map-making,** **2142–3**; Geological Survey, U.S., **3600–1**; latitude and longitude, **1968–9**; surveying, **3397–8**; weather maps, **3708**, *picture*, **3709**.

**Marabou** (*măr'ȧ-bụ*) **feathers,** **3362**.

**Maracaibo** (*mä-rä-kī'bō*). Chief port of Venezuela, in n.w. on channel between Gulf of Venezuela and L. Maracaibo; pop. 49,000; exports coffee, cocoa, hides and skins, cabinet and dye woods.

**Maracaibo, Lake,** in n.w. Venezuela opening through a long neck into Gulf of Venezuela; s. half of lake is fresh, but n. half, under tidal influence, is brackish; **3621**, *map*, **3622**.

**Marakesh** (*mä-rȧ-kĕsh'*). Same as **Morocco** (city).

**Maramuresh** (*mä'rȧ-mụ-rĕsh*) or **Marmaros** (*mär'mȧ-rŏsh*). Dist. in n.w. Rumania, formerly Hungarian county; 6258 sq. mi.; pop. 767,000.

**Maranhão** (*mä-rän-youn'*) or **Maranham.** Seaport on isl. of São Luiz in n. Brazil; pop. 58,000.

**Marañon** (*mä-rä-nyōn'*) **River,** in Peru, upper course of Amazon, **105, 2742**.

**Maraschino** (*măr-ȧ-skē'nō*) **cherries,** **716**.

**Marat** (*mä-rä'*), **Jean Paul** (1743–93), Fr. revolutionist, implacable, incorruptible, instigator of massacres and cruelties; a solitary figure, attached to no party, but always suspicious of every one in power; assassinated by Charlotte Corday; **1370, 961**.

**Mar'athon, battle of,** **2143–4, 2739**; Aristides at, **195**; Athenians aided by Pan, **2648**; by Theseus, **3487**.

**Marathon race,** **2144**.

**Marble,** a rock, **2144**; Carrara, **1844**; composition, **571**; quarrying, **2943–5**; U.S. supply, **70, 1432, 3468, 3632–3**.

**Marburg** (*mär'bụrĸ*), Germany. Town in Prussian province of Hesse-Nassau, famous for univ. (founded 1527, first univ. established without papal privileges); 13th cent. church containing tomb of St. Elizabeth of Hungary, and its 13th cent. castle.

**Marbury** *vs.* **Madison,** **2155**.

**Marcanto'nio** (1488?–1527?). Foremost Ital. engraver in the Renaissance, first to copy on copper the work of other artists (Dürer's 'Little Passion' and 'Life of the Virgin'; countless drawings and paintings by Raphael).

**Marcel'lus, Marcus Claudius** (268?–208 B.C.). A Rom. general in 2d Punic War, conqueror of Syracusc; five times consul; killed near Venusia.

**March, Peyton Conway** (born 1864), Amer. general, chief of staff in World War, **2145**.

**March,** 3d month of year, **2145**; birthday stone, **1409**; named from Mars, **2154**.

**Marches, The,** territorial division on e. coast of cent. Italy, formerly part of Papal States, **1840–1**.

**"March Hare,"** in 'Alice in Wonderland', **648–50**.

**Marco Bozzaris.** *See in Index* **Bozzaris.**

**Marco'ni, Guglielmo** (born 1874), an Italian, inventor of wireless telegraphy, **2145–6, 3760, 3761, 3766, 1122**.

**Marco Polo.** *See in Index* **Polo, Marco.**

**Marco Polo sheep,** **3199**.

**Marcos de Niza, Fray** (*frā mär'kōs dē nē'thȧ*), Franciscan friar, chosen to explore region of fabled wealth n. of Sonora, Mexico; penetrated to Zuñi, N.M. ("Seven Cities of Cibola"); **202, 2467, 892**.

**Marcus Antonius.** *See in Index* **Antony, Mark.**

**Mar'cus Aure'lius Antoni'nus** (121–180 A.D.), Rom. emperor, **2146–7, 3048, 3642**; equestrian statue, **3050**.

**Marcy, William Learned** (1786–1857), Amer. statesman, b. Southbridge, Mass.; prominent in "Albany Regency"; author of phrase "To the victors belong the spoils"; sec. of state 1853–57, **2802**.

**Marcy, Mt.,** highest peak of Adirondacks and highest point in N.Y. state, in n.e., **25**.

**Mardi Gras** (*mär'dē grä*), or Shrove Tuesday, **1070**; New Orleans celebration, **2470**, *picture*, **2071**.

**Ma're claus'um,** in international law, sea or portion of sea under jurisdiction of one nation instead of open to all; controversy over Bering Sea, **1593, 384–5**.

**Mare Island,** Calif., at e. end of San Pablo Bay, opposite Vallejo; length 2 mi.; U.S. naval station; **1225, 3501**.

**Marem'ma,** marshy region of w. Italy in Tuscany, **1838**.

**Maren'go,** village in n. Italy 35 mi. n.w. of Genoa; battle of (1800), **2394**.

**Marey, Etienne Jules** (1830–1904), Fr. physiologist; devised photographic methods of recording the motion of wings of insects and birds; photographic gun, **2352**.

**Mar'garet** or **Gretchen,** in Faust legends, **1228**.

**Margaret** (1353–1412), "Semiramis of the North," queen (governing as regent for nominal sovereigns) of Denmark, Norway, and Sweden; unites three Scandinavian countries, **997**.

**Margaret, Saint** (1045?–93). Queen of Malcolm III, king of Scotland; daughter of Edward the Exile of England, son of Edmund Ironsides; probably b. in Hungary; canonized 1251 on account of her great benefactions to the church.

**Margaret of Anjou** (1430–82), queen of Henry VI of England, died in exile; leads Lancastrians, **1634–5, 3066, 3068**.

**Margaret of Valois** or **Angoulême** (1492–1549). Queen of Henry d'Albert, king of Navarre, and sister of Francis I of France, joint author of the 'Heptameron', stories modeled on the 'Decameron' of Boccaccio; patroness of Marot and other literary men, and protector of Protestants; sometimes called Margaret of Navarre to avoid confusion with her grandniece (*see* next entry).

**Margaret of Valois** (1533–1615), daughter of Henry II of France and Catherine de' Medici, married to Henry (Bourbon) of Navarre (afterward Henry IV of France) on eve of Massacre of St. Bartholomew; **1637**.

**Margarine** (*mär'gȧ-rĭn*) or **oleomargarine,** **2577–9, 544**.

**Margarita** (*mär-gä-rē'tä*). Isl. in Caribbean Sea belonging to Venezuela; 400 sq. mi.; pop. 40,000; cap. Asuncion; pearl fisheries; discovered by Columbus 1498.

**Mar'gate,** England. Popular summer resort on North Sea 65 mi. e. of London; pop. 27,000.

**Mar'gin,** in grain exchange, **441**.

**Marguerite** (*mär'gē-rēt*), popular name of several flowers of the aster family, such as the China astor, common garden daisy, oxeye daisy; also some cultivated species of chrysanthemum; pollen grain, *picture*, **1309**.

**Maria II, da Gloria** (1819–53). Queen of Portugal; succeeded 1827 on abdication of her father, Dom Pedro; reign troubled by rebellion of her uncle, Dom Miguel, and factional insurrections.

**Maria Theresa** (*mä-rē'ä tĕ-rā'sȧ*) (1717–80), archduchess of Austria, and queen of Hungary and Bohemia, **2147**; and Francis I, **1355**; in Seven Years' War, **3180**.

**Maria Theresa** (1638–83), of Spain, queen of Louis XIV, **3620**.

**Mariager** (*mä'rē-ä-ġēr*). Small seaport of Denmark, in Jutland, 35 mi. n. of Aarhus.

**Maria'na Islands.** Same as **Ladrone Islands.**

**Marico'pas,** tribe of Indians of s.w. U.S.; early home near junction of Gila and Colorado rivers; moved up Gila; **1767**.

**Marie Antoinette** (*mȧ-rē' äñ-twȧ-nĕt'*) (1755–93), queen of Louis XVI, **2148**; flight to Varennes, **1368**; imprisoned in Temple, *picture*, **1367**; influence on Louis XVI, **2066**; and the boy Mozart, **2363**.

**Marie Galante** (*gä-länt'*). An isl. of Fr. W. Indies, s.e. of Guadeloupe; 60 sq. mi.; pop. 17,000.

**Marie Louise** (1791–1847), 2d wife of Napoleon I; daughter of Emperor Francis I of Austria; **2395, 2396**, *picture*, **2393**.

**Marienbad** (*mä-rē'čn-bät*). Celebrated watering place near w. border of Bohemia, Czecho-Slovakia; mineral springs.

**Marienburg** (*mä-rē'čn-bụrĸ*), Germany. City in Border Province (Grenzmark) of Prussia on Nogat R. 30 mi. s.e. of Danzig; pop. 14,000; old castle seat of Teutonic knights (1309–1457); occupied by Russians in World War; machinery and cotton mfrs.

**Marien-Platz,** Munich, *picture,* **2369.**

**Mariet'ta,** Ohio, on Ohio and Muskingum rivers; pop. 15,140; large river trade and numerous mfrs.; Marietta College; named for Marie Antoinette; first settlement in state, **2572.**

**Marietta College.** At Marietta, Ohio; co-ed.; founded 1797 as an academy, college charter 1835; liberal arts.

**Mariette** (*mä-rē-ĕt'*), **Auguste Edouard** (1821–81). Fr. Egyptologist; author of several books about his explorations and discoveries.

**Marignano** (*mä-rē-nyä'nō*) or **Melegnana,** town in n. Italy 10 mi. s.e. of Milan; victory of Francis I over Swiss allies of Milan (1515), **1354.**

**Mar'igold,** a plant of the aster family, **2148;** marsh, **2155.**

**Marine** (*mà-rēn'*) **Corps, 2149;** uniform and insignia, **3578–9,** *picture,* **3576;** in World War, **380, 699,** *picture,* **3800.**

**Mar'iner's compass.** *See in Index* **Compass.**

**Marinette** (*măr-ĭ-nĕt'*), Wis. Shipping port on Green Bay at mouth of Menominee R.; pop. 13,610; pianos, iron, lumber products, paper, cutlery; fisheries.

**Marini** (*mä-rē'nē*), **Giovanni Battista** (1569–1625). Italian poet ('L'Adone'); style stilted and bombastic.

**Marinus** (*mä-rē'nụs*), **Saint,** legendary founder of San Marino, **1842.**

**Mar'ion, Francis** (1732–95), Amer. Rev. soldier, **2149.**

**Marion,** Ind. Market town in agricultural dist. 61 mi. n.e. of Indianapolis; pop. 23,747; flour, paper, foundry products, trucks, shoes, furniture.

**Marion,** Ohio. Industrial city 46 mi. n. of Columbus in agricultural and limestone-quarrying dist.; pop. 27,-891; steam shovels, engines, rerolled steel, glass, rubber goods.

**Marionettes',** or puppets, **1039.**

**Mariotte** (*mà-rē-ŏt'*), **Edmé** (1620?–84), Fr. physicist, independent discoverer of Mariotte's law or Boyle's law; **2787.**

**Maripo'sa Grove,** Calif., **3176.**

**Mar'itime Provinces,** Canada, **602;** fur farming, **610.**

**Marius** (*mā'rĭ-ŭs*), in 'Les Miserables', lover of Cosette, **1695.**

**Marius, Gaius** (155?–86 B.C.), Rom. general, **3046, 2878.**

**Mar'joram,** an herb of the mint family, **3318, 3319;** as a dye, **3317.**

**Mark, Gospel of,** the Second Gospel and 2d book of New Testament, **1887, 2745.**

**Mark, Saint,** traditional author of the Second Gospel, **157–8.**

**Mark.** A silver coin, the monetary unit of Germany, adopted 1873; equals 23.8 cents in U.S. money.

**Mark Antony.** *See in Index* **Antony, Mark.**

**Mar'ken,** Netherlands, isl. and village in the Zuider Zee, **2441;** costume, *picture,* **2439.**

**Markets.** *See in Index* **Fairs and markets.**

**Markets, Bureau of,** U.S., **3600.**

**Mark'ham, Sir Clements** (1830–1916). Eng. geographer, for more than 60 years himself an active explorer and traveler, and instrumental in the exploration of uncharted areas; funds for Scott's South Polar voyage raised almost entirely by his efforts.

**Markham, Edwin** (born 1852). Amer. poet and educator, b. Oregon City, Ore. ('The Man with the Hoe and Other Poems').

**Marl,** soil consisting of clay and lime, **1235, 674.**

**Marl'borough, John Churchill,** first **Duke of** (1650–1722), Eng. general and statesman, **2149–50, 139.**

**Marlborough, Sarah Jennings Churchill, Duchess of** (1660–1744), favorite of Queen Anne, **2149, 2150.**

**Marlborough,** Mass. Boot and shoe mfg. city 28 mi. w. of Boston; pop. 15,028; nearly destroyed by Indians during King Philip's War (1676).

**Marlowe** (*mär'lō*), **Christopher** (1564–93), great Eng. poet and dramatist; "father of English tragedy" and of English blank verse; "most daring and inspired pioneer in all our poetic literature"; chief works, **1038, 1228;** influence on Shakespeare, **3190.**

**Marlowe, Julia** (born 1870), Amer. Shakespearean actress, b. England; starred with E. H. Sothern, whom she married; *picture,* **1037.**

**Mar'malade,** a preserve made of fruit, especially oranges, **2590.**

**Marmaros.** Same as **Maramuresh.**

**'Marmion',** poem by Scott, **3151.**

**Marmora** (*mär'mō-rä*), **Sea of,** anc. Propontis, sea between Europe and Asia, **963, 468,** *map,* **434.**

**Mar'moset,** a small monkey, **2290,** *picture,* **2289.**

**Mar'mots,** a squirrel-like rodent, **2912;** altitude range, *picture,* **397,** fur, **1390;** groundhog, **1543.**

**Marne** (*märn*) **River,** in n.e. France, **2150–1;** scene of two decisive battles of World War, **2150-1, 3792, 3805–6, 380;** work of Joffre and Foch, **1895, 1315.**

**Mar'onites,** a Christian sect of Syria, **3426.**

**Marot** (*mä-rō'*), **Clément** (1495?–1544), Fr. poet; introduced new grace and ease into stiff forms of Fr. poetry; his translation of Psalms into Fr. verse greatly advanced Reformation in France; chief works, **1365.**

**Marque** (*märk*), **letters of, 2810, 1794.**

**Marquesas** (*mär-kā'säs*) or **Mendaña Islands,** group of 11 Polynesian volcanic isls. in mid-Pacific, 4000 mi. w. of Peru, S. Amer.; 490 sq. mi.; **2621, 2624,** *map,* **2624–5.**

**Marqueste** (*mär-kĕt'*), **Laurent Honoré** (1848–1920), Fr. sculptor; statue of Victor Hugo in Sorbonne; many classical subjects; 'Cupid', *picture,* **940.**

**Marquette** (*mär-kĕt'*), **Jacques** (1637–75), Fr. Jesuit missionary and explorer, **2151;** accompanied by Joliet, **1900;** founds Sault Ste. Marie, Mich., **3130;** in Illinois, **1736;** quoted on Illinois R., **1730.**

**Marquette,** Mich., summer resort, mfg. and shipping center on L. Superior; pop. 12,718; claims largest steel and concrete ore docks in country; blast furnace and chemical plant, lumber mfrs.; **2226.**

**Marquette University,** at Milwaukee, Wis.; Rom. Cath. institution for men; founded 1864; college of arts and science, schools of law, engineering, medicine, dentistry, pharmacy, music; **2247.**

**Mar'quis** or **marquess,** Eng. nobleman next in rank below a duke; in Parliament, **2687.**

**Marquis of Queensbury rules,** for boxing, **476.**

**'Marriage',** a Little Talk by Arthur Mee, **2152–3.**

**Marriage,** forms of, **1224;** among Hindus, **1750, 1751;** polygamy, **2276, 3558, 3559, 2327;** in Siam, **3226.**

**'Marriage of Figaro',** opera by Mozart, **2363, 2584, 3181.**

**Marrow,** of bones, **452;** manufacturcs red corpuscles, **2999, 437.**

**Marryat** (*măr'rĭ-ăt*), **Frederick** (1792–1848). Eng. naval captain and novelist ('Midshipman Easy', etc., among best sea stories; 'Masterman Ready' and other boys' stories).

**Mars,** in Rom. myth., god of war, **2154;** father of Romulus and Remus, **3058.**

**Mars,** a planet, **2816–7;** canals, *pictures,* **2818;** orbit, speed, and size, *pictures,* **2816;** orbit superior to Earth's, **2815;** origin of name, **2154;** satellites, **2818, 2819.**

**'Marseillaise'** (*mär-sā-yāz'*), Fr. national song, **2404.**

**Marseilles** (*mär-sālz'*) or **Marseille** (*mär-sā'y'*), seaport on Mediterranean; 2d city of France; pop. 550,-000; **2154;** founded by Greeks, **1343;** harbor, *picture,* **1578;** soap, **3263.**

**Marsh,** a tract of low, wet land; developed for cranberry cultivation. **915;** dried by eucalyptus trees, **1186–7;** peat, **2704–5;** vegetation, **3700.**

**Marshall, Archibald** (born 1866). Eng. novelist; pictures the Eng. country gentleman and his family ('The Eldest Son'; 'The Old Order Changeth'; 'The Hall and the Grange').

**Marshall, John** (1755–1835), chief justice of U.S., **2154–5;** Jackson's attitude toward, **1857;** and Jefferson, **1883;** Liberty Bell, **976;** X Y Z Affair, **3826.**

**Marshall, Thomas Riley** (born 1854), Amer. lawyer, b. at North Manchester, Ind.; gov. of Ind. 1909–13; vice-president of U.S., **3746.**

**Marshall,** Tex. Industrial city 37 mi. w. of Shreveport, La., in fruit and vegetable-growing and stock-raising region; pop. 14,271; r.r. shops; makes powder, car wheels, fruit baskets, etc.; near gas field.

**Marshall Islands,** group of 24 Micronesian isls. 2700 mi. e. of Philippines; pop. 9000; mandatary of Japan; export copra; **2620, 2624,** *map,* **2624–5;** king and queen, *picture,* **2621.**

**Marshalltown,** Iowa. Industrial city 55 mi. n.e. of Des Moines in agricultural and stock-raising dist. (corn and hogs); pop. 15,731; meat-packing plants, r.r. shops; furnaces.

**Marshal Niel rose,** named for distinguished Fr. marshal, Adolphe Niel (1802–69), *picture,* **3067.**

**Marsh gas,** or methane, **1406, 1408, 642.**

**Marsh-hawk, 1606, 1607,** *pictures,* **1605, 1606.**

**Marshmallow,** plant of mallow family; sweetmeat made from, **630.**

**Marsh marigold,** plant of buttercup family, **2155.**

**Marsh nun,** a type of dragon-fly, **1028.**

**Marsh-treader,** a water-bug, *picture,* **3698.**

**Marsh wren, 3815.**

**Mars-la-Tour** (*mär-lä-tọr'*). Village in n.e. France, 15 mi. w. of Metz; battle (also called Vionville) in Franco-German War (1870) in which Ger. brigade was annihilated.

**Marston Moor,** plain in Yorkshire, England, 8 mi. from York; battle of (1644), **924;** results, **693.**

**Marsu'pials,** mammals such as kangaroo, with pouches for young, **1908, 2132;** Australian, **266;** evolutionary position, *diagram,* **128;** in New Guinea, **2453;** opossum, **2585;** of Tasmania, **3439.**

**Marsyas** (*mär'sĭ-ăs*), in Gk. myth., a satyr, **156.**

**Marten,** an animal of the weasel family, **2155–6;** altitude range, *picture,* **397;** fur, **1390.**

**Martha.** Sister of Lazarus and Mary, and friend of Jesus (Luke x, 38).

**Marthas Vineyard,** summer resort isl., off s.e. coast of Mass., **2170,** *map,* **2166;** Champlain's voyage, **687.**

**Martial** (*mär'shăl*), anglicized name of Marcus Valerius Martialis (40?–104? A.D.), greatest Rom. epigrammatist, **1967.**

**Martial law, 1972, 910;** declared in Southern states (1867), **780.**

**Martigny** (*mär-tēn-yē'*) or **Martigny-Ville,** Switzerland, town 33 mi. below e. end of L. Geneva; pop. 2000; near Rhone R., **3012.**

**Martin,** popes. For list *see in Index* **Pope.**

**Martin, Dr. Gregory** (d. 1582), Eng. scholar, translator of Douai version of Bible, **389.**

**Martin, Homer** (1836–97), Amer. artist, b. Albany, N.Y.; usually considered one of the three (Inness, Martin, Wyant) greatest Amer. landscape painters ('Harp of the Winds'); **2634.**

**Martin, Saint** (316–400), bishop of Tours, patron saint of France and cities of Mainz and Wurzburg; founds monastery of Ligugé, **2299.**

**Martinique** (*mär-tĭ-nēk'*), isl. of West Indies; Fr. possession; 385 sq. mi.; pop. 195,000; **2156,** *map,* **2514–5.**

**Martins,** insect-eating birds of the swallow family, **3398–9;** bird houses, **424,** *pictures,* **425.**

**Martinsburg,** W.Va., industrial city 55 mi. n.w. of Washington, D.C.; pop. 12,515; slate, limestone, timber near by; ships apples; lumber, hosiery, woolen goods, etc.; strategic point in Civil War; **3723.**

**Martins Ferry,** Ohio, industrial city on Ohio R. almost opposite Wheeling, W.Va.; pop. 11,634; in agricultural, coal, limestone, and iron region; iron products; birthplace of W. D. Howells, **1639.**

**Martyrs, 2156;** apostles, **157;** early Christians, **3052;** in England, **2157.**

**Marvell, Andrew** (1621–78), Eng. poet and satirist; under Restoration attacked Charles II and advocated a republic; remembered now for his lyrics; quoted, on death of Charles I, **693.**

**Marx** (*märks*), **Karl** (1818–83), Ger. socialist, founder and leader of Marxian socialism, **2156–7;** socialistic theories, **3268.**

**Mary,** mother of Jesus, **1887–8, 2108.** *See also in Index* **Madonna.**

**Mary** (1457–82), duchess of Burgundy; compelled to restore to her Dutch subjects rights lost under her ancestors (thus paving way for Dutch independence); **697;** tomb, **518.**

**Mary I** (1516–58), queen of England, **2157, 1636;** imprisons Elizabeth, **1136;** and Lady Jane Grey, **1542;** Knox opposes rule, **1941;** death a blow to Philip II's ambitions, **2763.**

**Mary II** (1662–94), queen of England and wife of William III, **2157, 3740–1, 1861;** Bill of Rights, **393.** *See also in Index* **William III.**

**Mary** (born 1867), queen of George V of England, *picture,* **1429.**

**Mary Magdalene** ("Mary of Magdala"), convert and devoted follower of Jesus (John xx), **1888.**

**Mary of Guise** or **Lorraine** (1515–60), queen of James V of Scotland, later regent for her daughter, Mary Queen of Scots; arranged Fr. alliance; used Scotland to aggrandize Guise family; opposes Protestant movement, **1941.**

**Mary Stuart** (1542–87), queen of Scots, **2158–60, 3148, 1137;** Edinburgh associations, **1080;** and John Knox, **1941.**

**"Mary and the Lamb,"** a folk-dance for children, *picture,* **1316.**

**Maryes' Height,** low ridge opposite Fredericksburg, Va.; stormed by Hancock, **1571.**

**Maryland,** a middle Atlantic state of U.S.; 9941 sq. mi.; pop. 1,449,661; **2160–4,** *maps,* **2162, 3584–5;** cap. Annapolis, **139;** Baltimore, **322;** Chesapeake Bay, **716;** chief products, **2160, 2162,** *picture,* **2161;** Mason and Dixon's line, **2164;** origin of name, **3347;** physical features, **2160;** Potomac R., **2902;** state flower, **3347;** U.S. Naval Academy, **2418–9.** —*History,* **2163–4;** colonial period, chief events summarized, **1664;** Annapolis settled (1649), **139;** Baltimore founded, **322;** and Northwest Territory, **2528;** in War of 1812, **3672;** in Civil War, **322, 1984, 149, 1453.**

**Maryland State College of Agriculture.** At College Park, Md.; men; founded 1856; agriculture, horticulture, science, engineering; teachers' training courses in agriculture.

**Maryville College.** At Maryville, Tenn.; Presb.; co-ed.; founded 1819; education, music, art, etc.

**Masaccio** (*mä-sä'chō*) (1402–29), nickname of Tommaso Guidi, Ital. painter; first to appreciate aerial perspective, to show figures in bold relief, and to introduce lively expressive action into painting; **2629.**

**Masai** (*mä-sī'*), an E. African people of Negro-Hamitic stock, remarkable for their fine physique, **37.**

**Masaryk** (*mä-sä-rēk'*), **Thomas Garrigue** (born 1850), Czecho-Slovak statesman, educator, and historian; leader in struggle for independence and first pres. of Czecho-Slovak Republic, **948.**

**Mascagni** (*mäs-kä'nyē*), **Pietro** (born 1863), Ital. composer, **2381.**

**Mas'cot, 2118.**

**Masefield, John** (born 1875), Eng. poet and dramatist ('Salt-Water Ballads'; 'The Everlasting Mercy'; 'The Tragedy of Nan'—virile realism and intense pathos), **1167.**

**Mashie,** a golf club, *pictures,* **1486, 1485.**

**Masho'naland,** region in S. Africa s. of Zambezi R., now part of Rhodesia; occupied by British, **3282.**

**Maskat.** Same as **Muskat.**

**Masks,** worn by Gk. actors, **3484,** *picture,* **1032.**

**Masks, gas, 1408.**

**Mason, Charles** (1730?–87), Eng. astronomer and surveyor; helped fix Mason and Dixon's line, **2164.**

**Mason, George** (1725–92). Amer. Rev. statesman, b. Fairfax County, Va.; author of Virginia Bill of Rights and Constitution of 1776; member of Constitutional Convention.

**Mason, James Murray** (1798–1871), Amer. jurist and statesman, b. Mason's Island, Va.; author of Fugitive Slave Law; Confederate commissioner to Gt. Brit. 1861; *Trent* affair, **3539.**

**Mason, John** (1586–1635), Amer. colonist, b. England; founder of New Hampshire, **2456.**

**Mason, Lowell** (1792–1872). Amer. musician, b. Medfield, Mass.; pioneer of musical instruction in public schools, and composer of hymn tunes.

**Mason and Dixon's line,** boundary line between Md. and Pa., **2164.**

**Mason City,** Iowa. Railroad center and distributing city for agricultural, stock-raising, and quarrying dist. 110 mi. n. of Des Moines; pop. 20,065; cement, sashes and doors, brick and tile; limestone quarries.

**Masons** or **Freemasons, 1361.**

**Mason wasps,** types that make mud nests, **3692.**

**Masque,** form of drama in which actors originally wore masks, **3484;** modern, **2625, 2626.**

**Mass,** the amount of matter, distinguished from the weight, in a physical object, **1508;** "conservation of mass," **2786.**

**Mass,** in Rom. Cath. church, the celebration of the sacrament of the Eucharist, commemorating the passion and death of Christ; music, **2378.**

**Massachu'setts,** one of New England states; 8266 sq. mi.; pop. 3,852,356; **2164–70,** *maps,* **2166, 3584–5;** cap. Boston, **469–73;** Cape Cod, **640;** chief cities, **2165–6, 587–8, 1223, 1973, 2075, 2087, 3332, 3787;** education, **1084, 1086, 2168, 2170;** historic places, **2164–5;** industries, **2165–8, 2169, 1283;** origin and meaning of name, **2165;** people, **2166;** physical features, **2168–70;** state flower, **3347.** —*History,* **2170, 472–3, 1664;** Plymouth founded, **2175–8, 2841–2;** early colonial life, **2844–6;** town meetings, **3521;** Gov. Winthrop, **3757;** first use of written ballot, **321;** first postal service in N. Amer., **2896;** New England Confederation, **3592, 3757;** Roger Williams exiled, **3742;** King Philip's War, **1772;** Salem witchcraft persecution, **3774;** boundary disputes, **868–9, 2456;** Coercive Acts, **3001;** James Otis, **2604;** Samuel Adams, **16;** John Hancock, gov., **1571;** battle of Lexington and Concord, **1990;** battle of Bunker Hill, **533–4;** whaling, **2448–9;** Shays' rebellion, **3197;** gerrymander, **1452;** Maine separated, **2129.** *See also in Index* chief cities and persons under their own names.

**Massachusetts Agricultural College,** at Amherst, Mass.; co-ed.; chartered 1863 (opened 1867) by the state; 4 years' course, special work in dairying, market gardening, etc.; **2170.**

**Massachusetts Bay,** arm of Atlantic indenting e. coast of Mass. from Cape Ann on n. to Plymouth harbor on s.; *map,* **2166.**

**Massachusetts Indians, 2165.**

**Massachusetts Institute of Technology.** At Cambridge, Mass.; co-ed.; incorporated 1861 (opened 1865); engineering and science of every kind; laboratory equipment permits of experimentation almost on industrial scale.

**Massacre of the Innocents,** slaughter of the children of Bethlehem by Herod's soldiers, **1887.**

**Massage** (*mä-säzh'*), (from Gk. word for "knead"), **2193.**

**Massa'lia.** Gk. name for Marseilles, France.

**Mas'sasoit** (1580?–1661), Amer. Indian, chief of Wampanoags in Mass.; steadfast friend of Plymouth colonists; treatics with Pilgrims, **2841, 1223;** at first Thanksgiving, **3482.**

**Massawa** (*mä-sä'wä*) or **Massowhah.** Seaport and chief town of Ital. colony of Eritrea in n.e. Africa, on Red Sea; pop. 2700; wireless station.

**Massena** (*mä-sā-nä'*), **André** (1756?–1817). Duke of Rivoli, and Prince of Essling, perhaps the greatest of Napoleon's marshals, called by him "spoiled child of victory"; victorious in Italy, Poland, Germany; first serious defeat by Wellington in 1810 in Peninsular War; thereafter saw no more active service.

**Massenet** (*mä-sē-nā'*), **Jules Emile Frédéric** (1842–1912), Fr. compos-

er; his distinctive style appears best in love scenes of his operas; chief works, **2381.**
**Mas'sillon,** Ohio. Industrial city 100 mi. n.e. of Columbus; pop. 17,428; trade in coal, sandstone, grain, and live stock; iron products, brick and tile, aluminum, paper, glass, flour.
**Mas'singer, Philip** (1584–1640), Eng. dramatist; author of 15 plays and collaborator with Fletcher and others in many more; most of his plays have an obvious moral intention, but his heroes are too good and his villains too wicked to be convincing; **1034, 1038.**
**Massive, Mt.,** peak of Saguache Range of Rocky Mts. in cent. Colo., **842, 3036.**
**Mast,** nuts borne by forest trees, **365.**
**Mast,** ship's, **3209.**
**Master,** degree, **831;** of Arts, **828;** of Science, **828.**
**"Master, remember the Athenians," 2739.**
**Masters, Edgar Lee** (born 1869). Amer. poet and novelist, b. Garnett, Kan.; 'Spoon River Anthology' (in a little graveyard of the Middle West the dead each in turn expose the bare bones of their lives); 'Children of the Market Place', historical novel in which Stephen A. Douglas is central figure.
**Master singers** (meistersinger), medieval gild of Ger. singers, **2378.**
**Mastersongs, 1436.**
**Mas'tic,** a Turkish gum, **1552, 3619, 2643.**
**Mastication, 1011.**
**Mastiff,** a huge Brit. dog with a large head and broad hanging ears; smooth-coated; color buff or fawn; **1021, 1023.**
**Mas'todon,** a hairy, elephant-like animal now extinct, **2132.**
**Mas'toid, 1057.**
**Masulipatam'** or **Bandar,** seaport of Brit. India in n. Madras on one of mouths of Kistna R.; pop. 43,000; weaving, bleaching, and cloth printing; rugs, **3079.**
**Matabeleland** (*măt-à-bē'lē-lănd*), dist. of S. Rhodesia, S. Africa; buffaloes, **131;** Brit. conquer, **3282;** native revolt of 1896, **3011.**
**Mat'ador,** in bull fights, the man who administers the fatal stroke to the bull, *pictures,* **2211, 3305.**
**Matagor'da Bay,** inlet of Gulf of Mexico at mouth of Colorado R., indenting s. coast of Tex.; La Salle reaches, **1964, 3478.**
**Matagorda Island,** long narrow isl. off coast of Tex., s.w. of Matagorda Bay, **3474.**
**Matamat'a,** a S. Amer. turtle, **3563.**
**Matamo'ras,** river port of Mexico on Rio Grande opposite Brownsville, Tex.; pop. 10,000; battle of, **2207.**
**Matanzas** (*mà-tăn'zàs*). Seaport and r.r. center on n. coast of Cuba, 50 mi. e. of Havana; pop. 63,000; chief export, sugar.
**Matanzas River** or **Bay,** inlet of Atlantic in e. coast of Fla.; St. Augustine on, **3106.**
**Matches, 2170–4;** phosphorus used, **2776–7;** primitive, *pictures,* **1251;** why easy to blow out, **1250.**
**Match-lock,** early hand-gun, **1252,** *picture,* **1253.**
**Match play** in golf, **1486.**
**Maté** (Span. *yerba maté*) or **Paraguay tea,** a S. Amer. beverage; **3451, 3446,** *pictures,* **3286;** in Brazil, **495;** Paraguay, **2677.**
**Materialists,** in philosophy, **2773.**
**Mathemat'ics,** the science of number and quantity, **2174;** Arabs' contribution, **2278;** Archimedes, **174–5;** calculus developed by Newton, **2476;** Ptolemy, **2931;** Pythagoreans, **2942.** *See also in Index* **Algebra; Arithmetic; Geometry.**
**Mather** (*măth'ēr*), **Cotton** (1663–1728), Amer. preacher and scholar, b. Boston; son of Increase Mather; leader of conservative New England Puritans and of Salem witchcraft persecution; historian of New England ('Wonders of the Invisible World'; 'Magnalia Christi Americana'); **472, 111.**
**Mather, Increase** (1639–1723), Amer. clergyman and author, b. Dorchester, Mass.; pastor of North Church, Boston, for 62 years; pres. of Harvard College 1684–1701 ('Remarkable Providences'; 'A Brief History of the War with the Indians in New England'); **472.**
**Mathew** (*măth'ū*), **Theobald** (1790–1856). "Father Mathew," Irish priest and temperance reformer.
**Matil'da** (d. 1083), queen of William I and daughter of Baldwin V, count of Flanders, **3739.**
**Matilda** (1080–1118), queen of Henry I of England and daughter of Malcolm III and St. Margaret of Scotland, **1633.**
**Matilda** (1102–64?), queen of England (crowned 1141), daughter of Henry I of England and wife of Emperor Henry V, **3352, 1633;** besieged at Oxford, **2608.**
**Mat'in,** one of the canonical hours, **2299, 2300.**
**Matisse** (*mä-tēs'*), **Henri** (b. 1869), Fr. painter and sculptor, leader of post-Impressionist school, **2634.**
**Ma'trix,** in type-making, **2916;** linotype, **2020;** monotype, **2304, 2305;** stereotype, **3355.**
**Matsys** (*mät-sīs'*) or **Massys, Quentin** (1466–1530), Flemish artist; religious subjects, portraits, etc. ('Burial of Christ' in Antwerp museum; 'Story of St. Anne', in Brussels gallery); **2630.**
**Mattathi'as** (d. 167 B.C.), Jewish priest, **1891.**
**Matte** (*măt*), impure metal produced by smelting; in copper refining, *diagram,* **883.**
**Matter,** composed of atoms and electrons, **256–7, 1112, 2174;** ether, **1180;** indestructibility and conservation of matter, **715, 2786;** motion of molecules causes heat, **1618–20.**
**Matterhorn** (*mät'tēr-hôrn*) (Fr. *Mont Cervin*), peak in Alps on w. frontier between Switzerland and Italy; 14,780 ft.; **3413,** *picture,* **102.**
**Mat'thew, Saint** (Hebrew "gift of God"), one of the Twelve Apostles, and traditional author of the First Gospel, **157.**
**Matthew, Gospel of Saint,** first of the Four Gospels and first book of the New Testament, **157, 1887, 2745.**
**Matthews, (James) Brander** (born 1852). Amer. man of letters, professor at Columbia after 1892; voluminous output of critical essays, literary history, novels, and dramas.
**Matthi'as,** one of the Apostles (Acts i), **157.**
**Matthias I, Hunyadi** (1440–90), king of Hungary. Also called Matthias Corvinus from the raven (*corvus*) on his escutcheon; son of János Hunyadi; elected king 1458, repeatedly defeated Emperor Frederick III, Turks, Poles, and became most powerful ruler in cent. Europe; equally capable as soldier, administrator, orator, law-maker; man of high moral qualities; one of the greatest monarchs who ever reigned.
**Matthioli** (*mät-ē-ō'lē*), supposed "Man in the Iron Mask," **1827.**
**Mat'thison, Edith Wynne** (Mrs. Charles Rann Kennedy) (born 1875). Amer. actress, b. in England; Shakespeare, Gk. and old Eng. revivals ('Everyman'; 'Iphigenia in Tauris'), modern drama.
**Mattoon',** Ill. City 70 mi. s.e. of Springfield; pop. 13,552; broom corn, fruit, and live stock interests; brooms, flour, shoes, wagons, foundry products, and engines.
**Matzoth** (*mät'sōth*) or **matzos,** unleavened bread, **2691.**
**Maubeuge** (*mō-bûzh'*), France. Fortified town near Belg. border, 50 mi. s.e. of Lille; pop. 23,000; taken by Germans 1914.
**Maude** (born 1869), queen of Haakon VII of Norway, **1089.**
**Maude, Cyril** (born 1862). Eng. actor, finished performer of many quietly humorous parts ('Grumpy').
**Maude, Sir (Frederick) Stanley** (1864–1917), Brit. general in World War; took part in Dardanelles and Kut relief expeditions; captures Bagdad, **3798.**
**Maugham** (*mąm*), **William Somerset** (born 1874). Eng. novelist and dramatist; distinguished by his smooth irony, sparkling wit, and objective dissection of character ('Liza of Lambeth'; 'Of Human Bondage'; 'The Moon and Sixpence'; 'The Unknown'; 'The Explorer').
**Maui** (*mä-ų'ē*), one of Hawaiian Isls.; 728 sq. mi.; **1603, 1601,** *map,* **1604.**
**Mau'mee River,** flows into L. Erie after course of 150 mi. through n.e. Ind. and n.w. Ohio; **1758, 3511,** *maps,* **1758, 2568.**
**Mauna Kea** (*mou'nä kā'ä*) (Hawaiian "white mountain"). Extinct volcano on isl. of Hawaii; highest peak in Pacific isls. (13,823 ft.).
**Mauna Loa** (*lō'ä*) ("great mountain"), active volcano on s. Hawaii Isl.; 13,675 ft.; crater of Kilauea on e. slope, **1604,** *pictures,* **1602, 3658, 3660.**
**Maundy** or **Holy Thursday, 1070.**
**Maunoury** (*mō-nọ-rē'*), **Michel Joseph** (born 1847), Fr. general, recalled from retired list in 1914; commanded VI Army, which turned Von Kluck's flank at first battle of Marne, **2151.**
**Maupassant** (*mō-pä-sänt'*), **Guy de** (1850–93), Fr. novelist, master of short story, **1665,** *picture,* **1364;** chief works, **1 66.**
**Maurepas** (*mō-rē-pä'*), **Lake,** s.e. La.; 13 mi. long; connected with L. Pontchartrain by 3 mi. channel; **2070.**
**Mauretania** (*mą-rĭ-tā'nĭ-à*). Anc. name for n.w. Africa, comprising modern Morocco and w. Algeria, **2323, 2328;** also colony in Fr. W. Africa; 344,967 sq. mi.; pop. 256,000.
**'Mauretania',** ocean liner, **3214, 3218.**
**Maurice** (*mą'rĭs*) (1521–53), duke and, by conquest of his cousin John Frederick, elector of Saxony; one of foremost generals and most cunning diplomats of his day; extorted from Emperor Charles V Treaty of Passau (1552), giving Protestants liberty of worship until Diet of Augsburg; deserts Protestants, **2988.**
**Maurice of Nassau** (1567–1625). Prince of Orange (son of William the Silent), Dutch general, one of ablest of his age; opposed successful resistance to Span. domination; shares guilt of Barnevelt's execution.
**Mauritius** (*mą-rĭsh'ŭs*), isl. in Indian Ocean; 720 sq. mi.; pop. 385,000; **2174–5, 1763;** dodo, **1017, 2175.**
**Mauritshuis** (*mą-rĭts-hus'*), picture gallery, The Hague, **1558.**
**Maury** (*mą'rĭ*), **Matthew Fontaine** (1806–73), Amer. oceanographer and meteorologist, b. Spottsylvania County, Va.; furnished, in words of Cyrus Field, brains for laying the

first Atlantic submarine cable ('Physical Geography of the Sea'), **561.**

**Mauser** (*mou'zēr*), a military rifle, **1254.**

**Mausole'um of Halicarnassus, 3178,** *pictures,* **1531, 3179.**

**Mausolus** (*mą-sō'lŭs*) (4th cent. B.C.). King of Caria, whose wife Artemisia erected famous "mausoleum" to his memory.

**Mavis** (*mā'vis*), the song-thrush, **3494.**

**Mawworm, 3814.**

**Max, Adolphe** (born 1869). Burgomaster of Brussels at beginning of World War; for 3 months, until imprisoned in Germany, heroically resisted efforts to break his moral and spiritual opposition to Ger. invaders.

**Max of Baden, Prince** (born 1867). Ger. soldier and statesman; as imperial chancellor (appointed Oct. 3, 1918) he began negotiations for armistice; brought pressure on Kaiser and announced his abdication; Nov. 10, 1918, handed govt. control to Ebert.

**Maxen'tius, Marcus Aurelius Valerius** (d. 312), elected Rom. emperor 306 A.D.; defeated by Constantine, **870.**

**Maxil'lae,** of insects, **1787.**

**Maxil'liped,** of crawfish, *picture,* **915.**

**Max'im, Sir Hiram S.** (1840–1916), Brit. inventor, b. Sangerville, Me.; inventor of Maxim automatic machine-gun and a smokeless powder; brother of Hudson Maxim; **2097.**

**Maxim, Hudson** (born 1853). Amer. inventor of explosives, smokeless powders; b. Orneville, Me.

**Maxim gun, 2097.**

**Maximil'ian I, the Great** (1573–1651). Elector and duke of Bavaria, helped form Catholic League which opposed Prot. Union in Thirty Years' War; party to peace of Westphalia 1648; considered ablest Cath. ruler of his time.

**Maximilian I** (1756–1825). First king of Bavaria; succeeded as elector 1799; aided Napoleon and received title of king as a reward.

**Maximilian II** (1811–64), Bavaria. Monarch of liberal tendencies; succeedcd to throne on abdication of his father 1848; opposed exclusion of Austria from Ger. confederation; father of the mad kings Ludwig II and Otto.

**Maximilian I** (1459–1519), Holy Roman emperor; succeeded 1493; called 2d founder of House of Hapsburg, which, by marriages of himself, son, and grandson, gained Netherlands, Spain, Hungary, and Bohemia, thus creating vast empire of Charles V and his successors; **697, 2896.**

**Maximilian** (1832–67), archduke of Austria and emperor of Mexico; younger brother of Emperor Francis Joseph; established on Mex. throne 1864 by Fr. bayonets, **2216;** U.S. secures deposition, **1898, 2307.**

**Maxwell, James Clerk** (1831–79), Scotch physicist, one of greatest of modern times, **1122,** *picture,* **1121;** laid foundations for radio-telegraphy, **3758, 3766.**

**May, Phil** (1864–1903). Eng. black-and-white artist, famous for his skill in using the fewest possible lines; chiefly depicted "low life" in London.

**May,** 5th month of year, **2175;** birthday stone, **1409.**

**May,** or hawthorn, **1607.**

**May, Cape,** southernmost part of N.J., *map,* **2458;** origin, **2788.**

**Mayaguez** (*mī-ä-gwāth'*), Porto Rico, city on w. coast; pop. 20,000; r.r. connection with interior; export trade; agricultural experiment station, **2886.**

**May-apple, 2175.**

**Mayas** (*mä'yąz*), race of Indians inhabiting peninsula of Yucatan at time of Span. conquest; developed a remarkable civilization; **3834–5;** ruins at Chichen-Itza, *picture,* **289;** writing, **3816.**

**May beetle,** or June bug, **1902.**

**May Day,** festival on first day of May, **2175;** in Harz Mts., **1595.**

**Mayflower,** or trailing arbutus, **173.**

**'Mayflower',** ship which brought Pilgrims to New England, **2175–8, 2841, 2844–5;** Bradford's passenger list, **2176–7.**

**Mayflower Compact, 2176.**

**Mayflower Descendants, Society of, 2695.**

**May-fly, 2178, 1786.**

**Ma'yo, Henry Thomas** (born 1856), rear admiral U.S. Navy, on Navy Gen. Board; graduate U.S. Naval Academy; admiral and commander-in-chief Atlantic fleet (1916–19); of U.S. fleet (1919); reverted to rear-admiral upon division of fleet; Tampico incident (1914), **2217.**

**Mayo, William James** (born 1861), and **Charles Horace** (born 1865). Amer. surgeons, brothers who developed famous Mayo clinic; established $1,500,000 Mayo Foundation for Medical Education and Research (1915), now a dept. of U. of Minnesota for graduate work.

**Mayo,** 3d largest county in Ireland (2157 sq. mi.) in Connaught province, bounded n. and w. by Atlantic; pop. 193,000; mountainous in w., flat in e.; cattle, salmon, linen goods; Irish Land League, **476.**

**Mayo Clinic,** surgical clinic at St. Mary's Hospital, Rochester, Minn., founded by Mayo brothers; noted for number and success of operations; attended by large numbers of surgeons, many of whom do graduate work; **2256, 1687.**

**Mayon** (*mä-yōn'*), volcano in Philippines, **2764.**

**May'or,** chief executive of Amer. villages and cities, **2370.**

**Mayor of the Palace** (*major domus*), official in Frankish kingdom under Merovingian rule; Carolingian dynasty founded, **1352.**

**Mayville,** N.D., town in e., 50 mi. n.w. of Fargo; pop. 1218; normal school, **2525.**

**Maywood,** Ill. Residential suburb of Chicago on Des Plaines R. 10 mi. w. of Chicago; pop. 12,072; makes tin plate and cans; lithographing works.

**Mazarin** (*mä-zä-răn'*), **Jules** (1602–61), Fr. cardinal and statesman, b. Italy; favorite of Anne of Austria; Fr. premier from 1642; continued Richelieu's policy of weakening Fr. nobility at home and Hapsburgs abroad; **2065;** in Thirty Years' War, **3488, 3018.**

**Mazarin Bible, 391, 2916.**

**Mazatlan** (*mä-sä-tlän'*), Mexico, port on w. coast at entrance to Gulf of Calif.; pop. 22,000; wireless station; outlet for mining region; besieged and captured by Constitutionalists (1914); **2209.**

**Maz'da.** Same as **Ahura Mazda.**

**Mazda,** a tungsten-filament electric bulb, **3548.**

**Maze.** *See in Index* **Labyrinth.**

**Mazeppa** (*mą-zĕp'ą*), **Ivan** (1644–1709). Cossack chief, powerful in Russia under Peter the Great; deserted to Charles XII of Sweden; **896.** (Read Byron's 'Mazeppa'.)

**Mazu'rian Lakes,** a sickle-shaped group of lakes in s. part of E. Prussia; strategically important in Hindenburg's eastern campaigns in World War; **1650;** battles of, **3810, 3794.**

**Mazzini** (*mät-sē'nē*), **Giuseppe** (1805–72), famous Italian revolutionary leader, **2178;** sets up republic in Rome, **1837;** influence on papacy, **2813.**

**Mead, Larkin Goldsmith** (1835–1910). Amer. sculptor, b. Chesterfield, N.H.; feeling and great detail but rough modeling; (Lincoln monument at Springfield, Ill.).

**Meade, George Gordon** (1815–72), Amer. Civil War general, **2179, 1453–4, 779,** *picture,* **1453.**

**Meades Ranch,** Kan., surveying station, **3398.**

**Meadowlark, 2179, 422,** *picture,* **418.**

**Meadow** or **field mice, 2359.**

**Meadowsweet,** a species of spirea, **3327.**

**Meadville,** Pa. City 86 mi. n. of Pittsburgh in agricultural, oil, and iron and steel mfg. region; pop. 14,568; Allegheny College and Meadville Theological School.

**"Mealies," 3283.**

**Mealy bug,** a scale parasite, **3133.**

**Mean'der** or **Maeander,** a r. of Asia Minor (now called Menderes) famous for its many windings; 240 mi. to its mouth at Miletus; **3023,** *map,* **1518.**

**Mean solar day, 969, 3500.**

**Mean solar time, 3500.**

**Meares, John** (1756?–1809), Eng. navigator; explored coast of Alaska; sailed to China by way of Hawaiian Isls.; at Columbia R., **2596.**

**Measles** (*mē'zlz*), a contagious disease common among children; probably a germ disease, **1450.**

**"Measly"** meat, **3813.**

**Measure** (arithmetic), a method of division, **1015.**

**Measurements and tests,** in education, **1793, 2931;** army tests, **1792–3;** reading, **2980;** spelling, **3314–5.**

**Measures.** *See in Index* **Weights and measures.**

**Measuring worm,** or cankerworm, **630.**

**Meat:** Argentina export, **192;** creosote a preservative, **918;** cuts of beef, *pictures,* **2185;** food value, **1320, 1321, 1322, 2926;** how to cook, **877;** how digested, **1010, 1011.**

**Meat packing, 2180–5;** by-products, **2181, 550, 1227, 1409, 1475, 2577–9, 2724, 3267;** canning, **631–3;** pork packing, **1671;** refrigeration, **2989–92;** S. Amer., **192, 494, 2316, 3608;** U.S. centers, **527, 766, 1760, 1912, 2272, 2570, 2581, 3111, 3169;** value of U.S. output, **3590.**

**Meaux** (*mō*), France. Town on Marne R. 20 mi. e. of Paris; pop. 13,000; marked closest approach to Paris of opening Ger. campaign in World War; farming and milling center.

**Mec'ca,** holy city of Mohammedans in Hejaz, Arabia, near Red Sea; pop. 80,000; **2186–7;** home of Mohammed, **2275,** *picture,* **2277.**

**Mechanical engineering, 1149.**

**Mechan'ics,** branch of physics dealing with force and motion, **2187–90, 2786;** gyroscope principle, **1555;** gravitation, **1508;** laws of falling bodies, **1508;** planetary motion, **1921.**

**Mechan'icsville.** A locality 7 mi. n.e. of Richmond, Va., where Federals repulsed Confederates in bloody battle June 26, 1862; first of Seven Days' battles of Peninsular Campaign; also called Beaver Dam Creek.

**Mechlin** (*měk'lĭn*), Belgium. *See in Index* **Malines.**

**Meck'lenburg-Schwerin** (*shvā-rēn'*). Republic in n. Germany, former grand duchy; 5068 sq. mi.; pop. 660,000.

**Mecklenburg-Strel'itz.** Republic in n. Germany, former grand duchy; 1131 sq. mi.; pop. 107,000.

**Mecop'tera,** an order of scorpion-shaped insects, **1788.**
**Medaille Militaire** (Fr.), **979.**
**Medal of Honor** (U.S.), or Congressional Medal, **976,** *picture*, **977.**
**Medal play,** in golf, **1486.**
**Medals, 976–9.**
**Medea** (*mē-dē'ȧ*), in Gk. myth., a famous enchantress, **193.**
**Medellin** (*mā-thĕl-yēn'*). Second city of Colombia; gold and silver mining and mfg. center, 150 mi. n.w. of Bogota; pop. 80,000; univ., school of mines.
**Medes** (*mēdz*), anc. Indo-European people of Caspian region, **2191, 2737, 2510, 298.**
**Medford,** Mass. Suburb 5 mi. n.w. of Boston on Mystic R.; pop. 39,038; machinery, cotton goods, dycs, and chemicals; Tufts College; Craddock House (1634), one of the oldest buildings in U.S. which retain original form.
**Me'dia.** Anc. kingdom and country now comprised in n.w. Persia; home of Medes.
**Medical Department,** U.S. Army, **217;** insignia, **3576, 3578.**
**Medici** (*mĕd'i-chi*), famous Florentine family, **2191, 1294, 3131;** Palazzo Vecchio, **1849.** For individual members *see in Index* under Christian names.
**Medicine and surgery, 2192–3, 3144;** anesthetics, **124–5;** antiseptics, **150–1;** antitoxins and serums, **151–2;** Arab contribution, **2278;** bone-setting, *picture*, **452;** diseases not inherited, **1644;** drugs, **1041–2;** earliest known treatise, **1102;** first aid, **1266–70;** germ theory of disease, **1449–52;** Health Department work, **1612–5;** hospitals, **1687–8;** hypnotism used, **1718;** nursing, **2544;** osteopathy, **2603;** Pasteur's work, **2692;** patent medicines, **1715;** physical reconstruction of wounded, **3653;** physiology, **2792–7;** progress in anatomy, **121;** radium used, **2960;** relations to dentistry, **998;** uses of X-rays, **3825–6;** work of Rockefeller Institute, **1086, 3034;** vaccination, **3613, 151–2.** *See also in Index* **Disease; Hygiene; Physiology and anatomy.**
**Medicine Bow Mts.,** a range of the Rockies in Colorado and Wyoming; highest point above 12,000 ft.; *maps*, **840, 3820.**
**Medicine Hat,** Alberta, industrial and agricultural center in s.e. on S. Saskatchewan R.; pop. 10,000; milling and mining interests; natural gas, **82.**
**Medicine man,** one who professes to cure disease by sorcery, **2193, 2120;** among N. Amer. Indians, **1771,** *picture,* **1773.**
**Medina** (*mā-dē'nä*), holy city in cent. Hejaz, Arabia, 110 mi. e. of Red Sea; much visited by Mohammedan pilgrims; pop. 40,000; Mohammed at, **2275–6;** railway, **165.**
**Medinet Abou** (*mā-dē'nĕt ä-bụ'*), Egypt, one of villages on site of anc. Thebes; remains, **570.**
**Medinet el Fayum.** *See in Index* **Fayum.**
**'Meditations',** work by Marcus Aurelius, **2147.**
**Mediterra'nean race, 2956;** Aegean civilization, **28, 29;** Cro-Magnon cave men, **666;** Irish, **1807;** in Malta, **2131;** Italy, **1842, 3040;** in Sardinia, **3126.**
**Mediterranean Sea,** arm of the Atlantic between Europe and Africa; 1,145,000 sq. mi.; **2193–4, 1188;** Adriatic, **26;** Aegean, **27–9;** climate, **1188, 2974;** coral fisheries, **886;** cuttlefish, **942;** early commerce, **2194, 2773–4, 3524;** Gibraltar western gateway, **1458;** Gk. colonies, **1520;** influence on Gk. civilization, **1517;** octopus, **943;** sardines, **3126;** sponge fisheries, **3330;** tides, **1188, 3498;** tunny, **3552.**
**Me'dium,** spiritualistic, **3327.**
**Medul'la oblonga'ta,** part of spinal cord just below the brain, **491,** *picture,* **490.**
**Medusa** (*mĕ-dū'sȧ*), in Gk. myth., one of the Gorgons, **2731–2,** *picture,* **3159;** head on shield of Athena, **248;** Pegasus sprung from, **2706.**
**Medusae,** jelly-fishes, **1883–4.**
**Medway.** Navigable r. in s.e. England, joining Thames at Sheernes near mouth; length 60 mi.
**Mee, Arthur** (born 1875). Eng. editor and author; editor *My Magazine, The Children's Newspaper,* 'Harmsworth's Self-Educator', 'Harmsworth's History of the World', 'Book of Knowledge', 'Harmsworth's Popular Science'; author 'Letters to Boys', 'Letters to Girls'. For list of articles in this work by Arthur Mee *see in Index* **Little Talks on Great Things.**
**Meer, Jan van der.** *See in Index* **Ver Meer.**
**Meerschaum** (*mēr'shạm*), a clay-like mineral used chiefly for pipes, **2194.**
**Meerut** (*mē'rŭt*), town in n. India 35 mi. n.e. of Delhi; pop. 116,000; cotton trade center; here Sepoy mutiny first broke out (1857); location, **1745.**
**Megaera** (*mē-ġē'rȧ*), in Gk. myth., one of Furies, **1382.**
**Megalopolis** (*mĕġ-ȧ-lŏp'ō-lis*). Anc. Gk. walled city in Peloponnesus; founded by Epaminondas (370 B.C.) as cap. of Arcadian confederacy; sacked by Spartans (222 B.C.).
**Meg'alosaur,** an extinct reptile, **134.**
**Meg'apodes,** or mound birds, family of Australian birds that do not brood their eggs, **1090.**
**Megara** (*mĕġ'ȧ-rȧ*). Cap. of Megaris, small dist. of anc. Greece w. of Attica; founded many colonies.
**Mège-Mouries** (*mêzh-mụr-ē'*), **Hippolyte,** Fr. chemist, inventor of oleomargarine, **2577.**
**Meg Merrilies.** In Scott's 'Guy Mannering', half-mad old gipsy witch.
**Mehadia** (*mē-hȧ'dē-ȯh*). Town in s. w. Rumania, famous for Hercules baths, known to Romans.
**Mehemet Ali** (*mā'hĕ-mĕt ä'lē*) (1769-1849). Viceroy of Egypt; massacred Mamelukes (1811); conquered Syria, but compelled by European powers to give it up in 1841; did much to develop Egypt.
**Meighen** (*mē'ĕn*), **Arthur** (born 1874), Canadian statesman, b. Anderson, Ontario; premier (1920–21); **620, 467.**
**Meikle** (*mīk'l*), **Andrew** (1719–1811), Scotch inventor, **3493.**
**Meissen** (*mī'sĕn*), Germany, town in Saxony on Elbe R. 15 mi. n. w. of Dresden; pop. 38,000; 13th cent. cathedral; Dresden china; **2883, 1041,** *pictures,* **2882.**
**Meissonier** (*mā-sō-nyā'*), **Jean Louis Ernest** (1815–91). Fr. military and genre painter ('Les Cuirassiers'; 'Friedland'; 'Rétraite de Russie').
**Meistersinger** (*mīs'tēr-zĭng-ēr*), "master singers," **2378.**
**'Meistersinger von Nürnberg, Die',** opera by Wagner, **3663, 2584.**
**Mekong** (*mā-kŏng'*) or **Cambodia River,** in s. e. Asia; rises in Tibet, flows 2600 mi. into China Sea; forms greater part of boundary between Siam and Fr. Indo-China; **3226, 1777.**
**Melanchthon** (*mĕ-lănk'thȯn*), **Philip** (1497–1560), Ger. religious reformer, friend and ally of Luther, and through his broad-minded tolerance, learning, and clear thought, the peacemaker and scribe of the Protestant Reformation, **2987.**
**Melane'sia,** division of Pacific Isls., **2619-20.**
**Mel'anism.** An excess of pigment in the skin and its appendages, producing real or comparative blackness; opposite of, and less frequent than, albinism.
**Melba, Nellie** (Nellie Porter Mitchell) (born 1859), Australian prima donna, celebrated in every country; her voice somewhat cold, but an exceptionally pure coloratura soprano (Lucia; Gilda in 'Rigoletto'); **269.**
**Melbourne** (*mĕl'bûrn*), **William Lamb, Viscount** (1799–1848), Eng. statesman, premier 1834, 1835–41, Queen Victoria's first guide and mentor in statecraft; **3639, 3640;** quoted on Macaulay, **2093.**
**Melbourne,** cap. of Victoria, Australia; pop. 745,000; **2194–5, 268,** *pictures,* **264, 268, 2195.**
**Melchers** (*mĕlk'ẽrs*), **Gari** (born 1860), Amer. genre and mural painter, b. Detroit ('Maternity', in Louvre; 'Peace and War', Congressional Library, Washington); **2634.**
**Melchisedek** (*mĕl-kĭz'ē-dĕk*). Priest-king (Gen. xiv, 18); taken as typifying Christ (Heb. vii, 1-21).
**Melegnano,** Italy. Same as **Marignano.**
**Melilla** (*mā-lēl'yä*). Span. fortified station and penal settlement on n. coast of Morocco; pop. 43,000.
**Mel'inite,** a picric-acid explosive, **1212.**
**Mellon, Andrew W.** (born 1852). Amer. financier, b. Pittsburgh, Pa.; sec. of treasury under President Harding.
**Melody,** in music, **2378.**
**Melon family** of plants, the *Cucurbitaceae,* **1492;** cucumber, **939,** melons, **2196,** pumpkins, **2934,** squash, **3333.**
**Melons, 2195–6, 1492;** when and how to plant, **1397.**
**Meloria, battle of, 2811.**
**Melos** (*mē'lŏs*) or **Milo,** mountainous Gk. isl. 75 mi. e. of s. Greece; 52 sq. mi.; exports sulphur, manganese; Venus of Milo found here 1820, **155, 1530, 1198,** *picture,* **1203.**
**Melpomene** (*mĕl-pŏm'ē-nē*), in Gk. myth., one of the Muses, **2373,** *picture,* **156.**
**Melrose,** Mass. Residential suburb of Boston 8 mi. n.; includes villages of Melrose Highlands, Fells. and Wyoming; pop. 18,204; rubber boots and shoes; settled in 1632.
**Melrose Abbey,** Scotland, in town of Melrose, 32 mi. s. e. of Edinburgh, *picture,* **2298;** heart of Bruce, **518.**
**Melting point,** of solids, **1361;** double in sulphur, **3389;** "low melting point" alloys, **428;** of platinum, **2831;** table, **1362.**
**Melun** (*mē-lŭn'*), France, mfg. and r.r. center on isl. and on both banks of Seine R. 28 mi. s. e. of Paris; pop. 15,000; **3173.**
**Melville, George W.** (1841-1912). Amer. admiral, scientist, and polar explorer, member of Jeannette polar expedition (commanded by De Long), commander of survivors, and member of Greely relief expedition.
**Melville, Herman** (1819-91). Amer. author ('Typee' and 'Omoo', earliest and among the best tales of the South Seas; 'Moby Dick, or the White Whale'; 'White Jacket', which effected abolition of flogging in U.S. Navy).
**Melville Island,** Australia, off center of n. shore; 1800 sq. mi.; densely wooded, especially with eucalyptus trees; *map*, **264–5.**
**Melville Island,** uninhabited Canadian isl. of Arctic regions n. of Victoria Isl.; 26,000 sq. mi.; *map*, **602–3.**
**Melville Peninsula,** Canada, 400 mi. n. of Hudson Bay between Gulf of Boothia and Fox Channel; 25,000 sq. mi.; *map*, **602–3.**
**Mem'branous lab'yrinth,** part of inner ear, **1057.**

**Memel** (*mā'mĕl*), Lithuania, Baltic fortified port 60 mi. s. of Libau; pop. 32,000; old Hanse town, formerly most northerly town in Ger. empire; taken by Russians in World War; taken from Germany by Peace Conference (1919); **2030, 1440.**

**Memel River.** *See in Index* **Niemen.**

**Mem'ling** or **Memlinc, Hans** (1430?–94), Flemish painter of portraits and religious subjects which he rendered with exquisite color and modeling and lifelike expression, **2630, 520.**

**Mem'non,** in Gk. myth., son of Eos and king of Ethiopians, **2196.**

**Memnon, Colossi of,** two colossal statues in Egypt, **2196, 1104, 1094,** *picture,* **1105.**

**Memo'rial Day, 2196, 1673.**

**Mem'ory, 2197, 2930;** in hypnosis, **1717-8;** place of memorizing, in education, **3373, 3374.**

**Mem'phis,** early cap. of Egypt at apex of Nile delta s. of Cairo, now in ruins, **1099.**

**Memphis,** Tenn., largest city of state; pop. 162,351; **2198, 2266,** *picture,* **3466;** La Salle, **3468.**

**Memphrema'gog, Lake,** in s. of Quebec province, Canada, and n. Vermont; length 30 mi.; **3633,** *map,* **2454.**

**Menai** (*mĕn'ī*) **Strait,** narrow channel (spanned by bridge) separating isl. of Anglesey from Wales, **3664.**

**Menam** (*mā-näm'*) **River,** chief r. of Siam, flowing s. from Burma 750 mi. and entering Gulf of Siam by several mouths, **3226;** rice culture, **3227.**

**Menan'der** (342–291? B.C.), Gk. dramatist, **1033.**

**Mencius** (*mĕn'shĭ-ŭs*) or **Meng-tse** (372?–289 B.C.), Chinese sage, placed second only to Confucius; born in Shantung, **3195.**

**Menck'en, Henry Louis** (born 1880). Amer. critic and essayist, b. Baltimore ('Prejudices'; 'In Defense of Women'; 'The American Language'); since 1914 editor of *The Smart Set.*

**Mendaña** (*mān-dä'nyà*) **Islands.** Same as **Marquesas.**

**Men'del, Gregor** (1822–84), Austrian priest and biologist, abbot of Brünn; discoverer of "Mendel's law" of heredity, **1642, 398, 539.**

**Mendeléeff** (*mĕn-dĕ-lā'yĕf*), **Dmitri Ivanovitch** (1834–1907). Russian chemist; formulated Periodic Law of the elements, by which he foretold properties of elements then undiscovered.

**Mendelssohn (Mendelssohn-Bartholdy)** (*mĕn'dĕl-sōn-bär-tōl'-dē*), **Felix** (1809–47), Ger. musician and composer, **2198.**

**Mendelssohn, Moses** (1729–86). Ger. (Jewish) philosopher, original of Lessing's 'Nathan the Wise' and grandfather of the musician Felix Mendelssohn.

**Mendès** (*mäⁿ-dĕs'*). **Catulle** (1841–1909). Fr. poet and novelist, one of Parnassian group; a versatile and accomplished writer ('Histoires d'amour'; 'Le roi vierge', best known of his novels; 'Sainte Thérèse' and numerous other plays).

**Mendip Hills,** England, range 6 mi. wide and 20 mi. long in w. Somersetshire; stalactite caves; Rom. remains; **1150.**

**Mendo'ta, Lake,** Wis., largest of 4 lakes at Madison; 4 mi. wide, 6 mi. long; **3770.**

**Mendo'za Don Pedro de** (1487?–1537), Span. captain, colonizer of Plata R. region in Argentina, **192.**

**Mendoza,** Argentina. Cap. of province of Mendoza, at foot of the Andes, 650 mi. n. of Buenos Aires; chief center for trade with Chile; pop. 60,000; 10,000 lives lost in earthquake of 1861.

**Menelaus** (*mĕn-ĕ-lā'ŭs*), in Gk. myth., king of Sparta, brother of Agamemnon and husband of Helen; organizes war against Troy, **3542;** recovers Helen, **3544;** wrests secret from Proteus, **2926.**

**Men'elik II** (1844–1913), emperor of Abyssinia, elected 1889; able and enlightened ruler; forced recognition of Abyssinian independence from European powers, **3.**

**Menendez de Aviles** (*mā-nän'dāth dā ä-vē-lās'*), **Pedro** (1519–74), Span. explorer, founder of St. Augustine, Fla., **3106;** explores Florida coast, **1295,** *map,* **1297.**

**Menes** (*mē'nēz*), **King,** first of historical kings of Egypt; unites Upper and Lower Egypt, **1099.**

**Menha'den,** an oily fish of the herring family, **1645, 1286;** sold as sardines, **3126.**

**Menhirs** (*mĕn'hĕrz*), prehistoric monuments, **3361.**

**Meningi'tis,** disease caused by inflammation of membranes surrounding the brain or spinal cord; inflammation due to bacteria, **1450.**

**Menkaura** (*mĕn-ka-rä'*) or **Mycerí'nus, Pyramid of, 2939,** *picture,* **2940.**

**Men'lo Park,** N.J., village 14 mi. s. w. of Newark; Edison's laboratory, **1084.**

**Men'nonites,** Protestant sect growing out of Anabaptist movement in 16th cent.; opposed to oath-taking, military service, and theological learning; hold to simplicity of life and worship and often live in separate communities; named from Menno Simons (1492–1559), leader in Netherlands; forbid use of buttons, **548;** numerical rank, **2994.**

**'Men of Harlech'** (*här'lĕĸ*), Welsh song, **2405.**

**Menoher, Charles T.** (born 1862). Maj.-gen. U.S. Army; graduated U.S. Military Academy 1886; staff and General Staff work 1898–1907; commanded 42d Division, A.E.F., Dec. 1917 to Nov. 10, 1918; commanded 3d Corps, A.E.F., Nov. 10, 1918 to Dec. 17, 1918; named director U.S. Army Air Service Jan. 2, 1919.

**Menom'inee River,** Wis., small r. emptying into Milwaukee R. at its mouth, **2246.**

**Menominee River,** formed by union of Michigamie and Bois Brulé rivers on boundary between Wis. and upper Mich.; flows s. e. 125 mi. to Green Bay, *map,* **2226.**

**Menshiviki** (*mĕn-shĭ-vē-kē'*), minority of Rus. Social Democrats, opposed to Bolshevism, **450.**

**Mental therapy, 2193.**

**Men'tha,** the genus of mint plants, **2257–8.**

**Men'thol,** a waxy substance used locally to relieve itching or pain; distilled from peppermint oil, **2257.**

**Men'tor.** In Gk. myth., friend of Odysseus and guardian of his son Telemachus; hence a wise counselor.

**Menzel** (*mĕn'tsĕl*), **Adolph** (1815–1905). Ger. artist; revived technique of engraving on wood, and by order of the emperor illustrated the works of Frederick the Great, establishing himself as one of the first illustrators of his day; also painted large number and variety of subjects.

**Mephistopheles** (*mĕf-ĭs-tŏf'ĕ-lēz*), an evil spirit in the Faust legends, **1227–8, 1478.**

**Mer'cantilists,** in economics, defined, **1078.**

**Mercantini** (*mĕr-kän-tē'nē*), **Luigi** (1821–72), Ital. poet, author of 'Garibaldi Hymn', **2405.**

**Mercator** (*mĕr-kā'tĕr*), **Gerard** (1512–94). Flemish geographer and map-maker; originated "Mercator's projection" of the globe.

**Mercator's projection, 2143.**

**Merced** (*mĕr-sĕd'*) **River,** rises in Sierra Nevadas in e.-cent. Calif. and flows 160 mi. s. w. to Joaquin R.; Yosemite Valley, **3831–2.**

**Mer'cer, John,** Eng. chemist; discovers process of mercerizing, **2198.**

**Mercerizing,** process which gives silky finish to cotton, **2198–9.**

**Mercersburg,** Pa., borough in s.-cent. part of state; pop. 1663; formerly seat of noted Ger. Reformed church seminary; home of Buchanan, **521.**

**Mercer University.** Bapt. institution for men at Macon, Ga.; founded 1833; liberal arts, law, pharmacy.

**Merchant gilds, 1460.**

**Merchant marine,** U.S., **3208, 3210, 3212, 3218–20;** Great Lakes, **3218, 1512, 1513.**

**'Merchant of Venice',** comedy by Shakespeare, **2199;** quotations from, **3192, 3194.**

**Mercia** (*mĕr'shĭ-à*). An Anglo-Saxon kingdom in cent. England, 6th to 9th cents.; during 8th cent. it was the most powerful of all the kingdoms.

**Mercier** (*mĕr-syā'*), **Desiré Joseph** (born 1851), Belgian cardinal and patriot, **2199;** on burning of Louvain, **2073.**

**"Merciless Parliament," 3016.**

**Mer'cury** or **Mercu'rius,** in Rom. myth., the messenger of the gods, and god of merchandise and merchants; identified with Gk. Hermes, **1644;** identified with Odin, **2560;** 'Flying Mercury', *picture,* **3159.** *See also in Index* **Hermes.**

**Mercury,** the smallest planet, **2816;** orbit, speed, and size, *pictures,* **2816, 2815;** has no satellites, **2818.**

**Mercury,** or quicksilver, a fluid metallic element, **2199–2200;** in Andes, **123;** in barometers, **333;** bichloride (corrosive sublimate), **151, 2854;** in Brazil, **494;** Calif. production, **582;** in compensating pendulum, **2715;** fulminate a violent explosive, **1211;** freezing point, **1362;** separates gold in placer mining, **1480;** Span. production, **3302;** sulphide (cinnabar ore), **3390;** used for backing mirrors, **2261;** why used in thermometers, **3486.**

**Mercutio** (*mĕr-kū'shĭ-ō*). In Shakespeare's 'Romeo and Juliet', witty friend of Romeo.

**Mer de Glace** (*mĕr dē gläs*), glacier on Mt. Blanc, **101.**

**Mer'edith, George** (1828–1909), Eng. novelist and poet, one of great masters of Victorian Age; 'The Egoist', his masterpiece, analytical and subtle; 'Richard Feverel', easier reading, containing some of his most beautiful passages; 'Diana of the Crossways', his greatest popular success; 'Harry Richmond', a fascinating romantic novel; work characterized, **1167, 2540.**

**Meredith, Owen.** *See in Index* **Lytton, Edward Robert, Earl of.**

**Merganser** (*mĕr-găn'sĕr*), a fish-eating type of duck, **1046;** foot, *picture,* **409.**

**Mergenthaler** (*mĕr'gĕn-tä-lĕr*), **Ottmar** (1854–99), Ger.-Amer. inventor of linotype, **2019.**

**Mérida** (*mā'rē-thä*). Cap. of Yucatan, Mexico, 23 mi. s. of its port, Progreso, on Gulf of Mexico; pop. 63,000; large commerce in sisal hemp.

**Mer'iden,** Conn., city 18 mi. n. of New Haven; pop. 29,867; silverware, **864.**

**Meriden,** N. H., village 45 mi. n. w. of Concord; bird refuge, **426.**

**Merid'ian,** Miss., chief city of state, 90 mi. e. of Jackson; pop. 23,399; cotton products, lumber, r.r. machinery; **2264.**

**Meridian,** an imaginary n. and s. line on earth's surface, **1968, 2061;** on maps, **2142, 2143.**

**Mérimée** (*mā-rē-mā'*), **Prosper** (1803–70). Fr. novelist, historian, and critic, great master of style ('Colomba'; 'Carmen'; 'Lettres à une inconnue').
**Meri'no,** a breed of sheep, **3199–3200,** *picture,* **3199**; wool, **3782.**
**Mer'lin,** legendary Brit. bard, prophet, and magician of Arthurian times, **223, 224, 3068.**
**Mer'maids,** mythical sea maidens, half human, half fish, **2200.**
**Mer'men, 2200.**
**Merovingians** (*mĕr-ō-vĭn'ĝĭ-ans*), Frankish royal line (ruled 496–752), **1352.**
**Mer'rick, Leonard** (born 1864). Eng. novelist ('Conrad in Quest of His Youth'; 'Cynthia'; 'The Actor-Manager'; 'The Man Who Understood Women').
**'Mer'rimac',** Confederate ironclad warship in Amer. Civil War, **2286–7, 779.**
**Merrimack River,** rises in White Mts. of N.H. and flows s. through Mass. into Atlantic at Newburyport; water-power, **2454**; at Lawrence, **1973**; at Lowel, **2075**; *maps,* **2454, 2166.**
**Mer'ritt, Wesley** (1836–1910). Amer. soldier, graduated from West Point 1860, distinguished himself as cavalry commander in Shenandoah valley and in Richmond campaigns, and rose to rank of maj.-gen. of volunteers; May 1898 commanded U.S. troops in Philippines and was first military gov. of the isls.; retired 1900.
**Merry del Val** (*mĕr'ē dĕl väl*) (born 1865). Cardinal of Rom. Cath. church, b. in London, England, of Span. parentage; papal sec. of state under Pius X ('Truths of the Papal Claims').
**Merry Mount.** Settlement made by Thomas Morton and others within present Quincy, Mass. (1625); dispersed by disapproving Plymouth Puritans.
**'Merry Wives of Windsor',** drama by Shakespeare, **1164.**
**Mer'sen, Treaty of.** Charles the Bald of France and Louis of Germany divided Lotharingia, the territory left by their nephew Lothair II (870).
**Mer'sey,** r. in n. w. England; flows 70 mi. w. to Irish Sea; wide estuary forms Liverpool harbor; **2031, 2032**; Manchester ship canal, **2134.**
**Merthyr Tydfil** (*mĕr'thĕr tĭd'vĭl*), city in s. Wales on R. Taff, 22 mi. n. w. of Cardiff; pop. 75,000; chief seat of Welsh iron industry; **3664.**
**Merton College,** Oxford, founded, **2610.**
**Merv** (*mĕrf*), oasis and anc. city in Rus. Turkestan, 120 mi. n. of Afghanistan frontier, **228.**
**Mesa** (*mā'sȧ*), tableland of s.w. U.S. **844, 2791,** *picture,* **1766**; Ariz., **200**; N.M., **2462, 2464**; site of pueblos, **2933.**
**Mesa'bi Range,** Minn., famous iron-mining region, **2254, 1817, 1820,** *map,* **2254**; open pit mine, *picture,* **1816.**
**Mesa Verde** (*vĕr'dā*) (Span. "green table"), national park in s.w. Colo.; 77 sq. mi.; ruins of prehistoric cliff dwellings, **844,** *pictures,* **793, 794, 844.**
**Mescal',** Mex. beverage, **42, 2213.**
**Mescale'ros,** Indian tribe, **2467.**
**Mesdag** (*mĕs'dăĸ*). **Hendrik Willem** (1831–1915), Dutch marine painter, distinguished for studies of North Sea ('Return of the Fishing Boats'; 'After the Storm'); gave collection to the Hague, **1558.**
**Meshed** (*mĕsh-ĕd'*) ("place of martyrdom"), Persia, cap. of province of Khorasan in n.e.; pop. 70,000; fine silks, carpets, sword blades; shrine of Imam Riza, famous Shiite leader of 9th cent.; visited by many pilgrims; **2734.**
**Mes'mer, Friedrich Anton** (1733–1815), Austrian physician and charlatan, author of theory of "animal magnetism" or "mesmerism," **1718.**
**Mes'merism** or **hypnotism, 1717–8.**
**Mesoceph'alic,** in ethnology, **2956.**
**Mesohip'pus,** extinct horse-like animal, *picture,* **1682.**
**Mes'ophytes.** Plants growing in moist but not wet localities.
**Mesopota'mia,** region in Asia between Tigris and Euphrates rivers, **2200–1,** *map,* **232–3**; Bagdad, **304–5**; Euphrates R., **1187**; excavations at Nineveh, **2510**; oil fields, **2755,** *map,* **2752**; anc. seals, **1410**; Tigris R., **3499.** —*History,* **2201**; early civilization, **232**; Arab rule, **305, 166**; devastated by Mongols, **2285**; World War, **3798, 3812.** For anc. history *see in Index* **Babylonia and Assyria.**
**Mesozo'ic era,** in geology, **1418, 1420**; plant and animal life, **132–8.**
**Mesquite** (*mĕs-kē'tĕ*), a deep-rooted shrub of the bean family, **2201.**
**Messalina** (*mĕs-ȧ-lī'nȧ*), **Valeria** (d. 48 A.D.). Profligate 3d wife of Rom. emperor Claudius.
**Messe'nia,** county of anc. Greece in s.w. Peloponnesus; cap. Messene; *map,* **1518**; conquered by Sparta, **1520.**
**Messi'ah** ("the Anointed"), **1888.**
**'Messiah',** oratorio by Handel, **1572, 1573.**
**Messina** (*mĕ-sē'nȧ*), seaport in n.e. Sicily on Strait of Messina between Italy and Sicily; pop. 150,000; **3229–30, 1066,** *picture,* **1065**; "Sicilian Vespers," **377.**
**Messina, Strait of,** between Italy and Sicily, **3229, 3230,** *map,* **1836**; Scylla and Charybdis myth, **2563**; mirages, **2261.**
**Mestizos** (*mĕs-tē'zōz*), persons of mixed blood in Span.-Amer. countries, **3288**; Chile, **738**; Ecuador, **1079**; Philippines, **2766**; Uruguay, **3608**; Venezuela, **3622.**
**Meta** (*mā'tȧ*), a r. of Colombia 600 mi. long, **2600,** *map,* **835.**
**Metacar'pal bones** in the palm of the hand, **1571.**
**Metallurgy** (*mĕt'ȧ-lûr-ĝĭ*), science of metal extraction and refining, **2201**; alloys, **99**; assaying, **236**; electric furnace, **1382–3**; thermit reduction, **105.** *See also* under names of most important metals.
**Metals, 2201**; abundance in earth, **711**; alloys, **99**; assaying, **236**; in bases and salts, **10**; bell-casting, **378**; conduct heat, **1619**; conduct electricity, **1110**; crystallization, **935, 279**; ductility, **3757, 1482, 2831, 3242**; earliest uses, **772–3, 1655, 515, 1098, 1816–7**; first used as money, **2281**; first used in war, **295**; welding, **3716, 7.** *See also in Index* **Minerals**; and the principal metals by name.
**Metal work:** Damascus blades, **956–7**; Japanese, **1874, 1876**; silver, *picture,* **3241.**
**Metal-working machinery, 3514–6.**
**Metamor'phic rocks,** those derived from older rocks by heat, pressure, or chemical change, **1417**; marble, **2010, 2144**; quartzite, **2945**; slate, **3248.**
**'Metamorphoses'** (*mĕt-ȧ-môr'fō-sēz*), poem by Ovid, **1967.**
**Metamorphosis** (Gk. "change of form"), in zoölogy, transformation of structure during growth; ants, **140**; bees, *pictures,* **1787**; beetles, **368,** *pictures,* **368, 369**; butterfly and moth caterpillars, **546, 660–2**; cicada, **764**; dragon-fly, **1030,** *pictures,* **1029**; eels, **1089**; extra growth-stage in May-flies, **2178**; extra larval stages of oil and blister beetles, **370**; frog tadpoles, **1374**; hornet-moth, **1790–1,** *pictures,* **1790**; insects, **1785–6, 1964, 2936**; lacewing fly, **1789–90**; locust, *picture,* **1505**; mosquito, *pictures,* **2335**; toad tadpoles, **3507.**
**Met'aphor,** figure of speech, **1238.**
**Metaphys'ics,** branch of philosophy, defined, **2772.**
**Metasta'sio, Pietro Bonaventura Trapassi** (1698–1782). Ital. poet and dramatist, court poet at Vienna for 50 years; composer of many lyric dramas.
**Metatar'sal bones** of the foot, **1322.**
**Metatar'sus,** scientific name for instep, **1322.**
**Metathe'ria,** the marsupial subclass of mammals, **3950.**
**Metaurus** (*mē-tą'rŭs*). Small r. in cent. Italy, emptying into Adriatic Sea; scene of defeat and death of Hasdrubal 207 B.C.
**Metazo'a,** animal group including all many-celled types, **127.**
**Metchnikoff** (*mĕch'nĭ-kŏf*), **Elie** (1845–1916). Rus. bacteriologist, naturalized in France; originated theory of phagocytosis, that inflammation is due to struggle between white corpuscles and disease germs in the blood; held that a diet of sour milk would lengthen human life by checking intestinal bacteria; 1908 Nobel prize winner in medicine.
**Metempsychosis** (*mē-tĕmp-sĭ-kō'sĭs*), or transmigration of souls, **1651, 525, 2941.**
**Meteo'ra,** famous monastery in Thessaly, **1528.**
**Meteorol'ogy,** science of weather and climate, **3707–9**; barometers used, **332–3**; kites, **1930**; measuring humidity, **1717**; measuring rainfall, **2974**; recording thermometers or thermographs, **3487**; related to physiography, **2787**; sounding balloons, **312,** *picture,* **314.** *See also in Index* **Climate; Weather.**
**Me'teors and meteorites,** "shooting stars," **2202–4**; largest known meteorite, **2704**; set on fire by air, **52,** *picture,* **51**; in Saturn's rings, **2817**; supposed to have helped build up Earth, **2819.**
**Me'ter,** in poetry, **2850–1.**
**Meter,** a unit of the metric system (39.37 in.), **2206**; standard, *picture,* **3714.**
**Meters,** for gas, electricity, and water, **2204–6.**
**Meth'ane,** or marsh gas, **1406, 1408. 642**; function in bacteria, **303.**
**Meth'odism,** a religious movement whose various bodies have a world membership of about 10,000,000; founded by Wesley, **3717–8**; numerical rank, **2994**; Sunday School, first in U.S., **3396**; in Wales, **3665.**
**Metho'dius** (d. 885). "Apostle of the Slavs"; brother and co-laborer with Cyril.
**Methu'en,** Mass. Residential city 26 mi. n. of Boston on Spicket and Merrimack rivers; pop. 15,189; cotton and woolen goods, yarns, bells.
**Methuen Treaty** (1703), **2890.**
**Methuselah** (*mĕ-thū'sĕ-lȧ*). Son of Enoch and father of Lamech; Gen. v, 27 assigns him a lifetime of 969 years.
**Meth'yl alcohol,** wood alcohol, **84.**
**Met'ic,** in anc. Athens, **1522.**
**Métis** (*mā-tēz'*), Fr.-Canadian half-breeds, **2137.**
**Metopes** (*mĕt'ō-pēz*), in architecture, *picture,* **180**; of Parthenon, **11.**
**Met'ric system** of weights and measures, **2206, 3714.**
**Metric ton** (*millier*), unit in metric system (2204.6 lbs.), **2206.**
**Met'ronome,** instrument for marking time in music, *picture,* **2382.**
**Metropol'itan Museum of Art,** New York City, **2494,** *picture,* **2493.**
**Metternich** (*mĕt'ĕr-nĭĸ*), **Clemens, Prince** (1773–1859), Austrian reactionary statesman and diplomat; influence over Congress of Vienna (1814–15) secured preponderance of Austria in European affairs; period 1815–48 is sometimes called "Age of Metternich"; **3642, 85, 1196**; quoted on Italy, **1837.**

**Metz,** France, city of Lorraine, formerly held by Germany; pop. 70,000; **2206–7;** besieged by Germans in 1870, **1356;** story, 'How the Tricolor Came Back to Metz', **103–4.**

**Meunier** (*mû-nyā'*), **Constantin** (1831–1905), Belg. sculptor and painter, **3158;** 'The Hammerman', *picture,* **3161.**

**Meuse** (*mûz*), important river of w. Europe; 560 mi. long; in Holland called Maas; **2207,** *picture-map,* **3802–3;** commerce, **2207, 3068;** delta, **2438;** in World War, **193, 194, 3110, 3171, 3628, 3629.**

**Meuse-Argonne.** Region in France between Verdun and Vouziers extending from Meuse R. 25 mi. w. to Aisne R.; scene of famous World War battle.

**Meuse-Argonne, battle of** (Sept. 26—Nov. 11, 1918), successful struggle of Amer. and Fr. troops under Pershing to seize the Meuse-Argonne region from Ger. army and thereby cut its communications between Germany and n. France, **193–4, 3806.**

**Mexican grass,** a fiber obtained from several species of Mex. agaves; used in brush mfr., **516.**

**Mexican mahogany, 2125.**

**Mexican War** (1846–48), between Mexico and U.S., **2207–8, 2872;** Calhoun's attitude, **576;** Calif. seized, **580–1;** Lowell's opposition in 'The Biglow Papers', **2207, 2074;** Gen. Scott in, **2208, 3153;** territory ceded to U.S., *map,* **3605;** and slavery question, **2207, 855–6;** Zachary Taylor in, **2207–8, 3444.**

**Mex'ico,** a republic of N. Amer., south of the U.S.; 767,198 sq. mi.; pop. 15,500,000; **2208–18,** *maps,* **2209, 2514–5;** agriculture, **2213, 2214, 42;** cap., Mexico City, **2218–9;** climate, **2210, 2219, 3834;** coast line and harbors, **2209, 3626;** earthquakes, **1066, 2219;** elevation, *map,* **2514–5;** government, **2218;** Lower Calif., **587;** lumber, **2213–4, 2046–7, 2125;** manufactures, **2212–4, 2219;** mineral resources, **2210–2;** peonage, **3249;** petroleum, **2211–2, 2752, 2753, 2755,** *picture,* **2214;** population, **2208, 3834,** *map,* **2514–5;** rainfall, **2210, 2219,** *map,* **2514–5;** Rio Grande, **3022;** rubber, **2212, 3074;** topography, **2209–10, 2515, 3834;** vegetation, *map,* **2514–5;** Vera Cruz, **3626–7;** Yucatan, **3834–5.** —*History,* **2214–8;** Aztecs, **288–90, 2219;** Mayas, **3834–5;** Cortez conquers, **894–5;** Coronado's explorations, **892;** revolt from Spain, **2214;** Texas revolts, **3478;** war with U.S. (1846–48), **2207–8, 2872** (*see also in Index* **Mexican War**); attempt to establish Fr. empire, **2216, 2307;** Diaz' rule, **1006, 2216;** Carranza's rule, **2217–8;** U.S. relations, **2307, 1898, 3746, 2217;** German intrigues, **2218, 3800.**

**Mexico.** State in s.-cent. Mexico; 9230 sq. mi.; pop. 1,009,000; cap. Toluca.

**Mexico, Gulf of.** *See in Index* **Gulf of Mexico.**

**Mexico City,** cap. of Mexico; pop. 472,000; **2218–9;** cathedral, *picture,* **2217;** Cortez captures, **894, 895;** captured by Scott, **2208;** site of anc. Tenochtitlan, **288.**

**Mexitli,** Aztec name for Mexico City, **2219.**

**Meyerbeer** (*mī'ĕr-bār*), **Giacomo** (1791–1864). Ger. composer of operas ('The Huguenots'; 'Dinorah').

**Meynell** (*mĕn'ĕl*), **Alice** (born 1850). Eng. poet and essayist; warmly appreciated by a limited public for the faultless delicacy of her work ('Poems'; 'The Rhythm of Life').

**Mézières** (*mā-zyĕr'*). Town in n. France, 125 mi. n.e. of Paris; resisted Allies for 6 weeks after Waterloo 1815; taken by Germans 1871 and 1914.

**Mez'zotint,** method of engraving, **1170.**

**Miam'i,** Ariz. Copper-mining town in Pinal Mts. near Globe; pop. 6689.

**Miami,** Fla., in s.e. on Biscayne Bay; pop. 29,571; terminus of Dixie Highway; important shipping point for fruit, vegetables, and fish; **1300;** grapefruit, **1500.**

**Miami,** Okla. City in n.e.; pop. 6802; lead and zinc mining, farming and live stock interests.

**Miami and Erie Canal,** running from L. Erie to Cincinnati, **2568, 766.**

**Miami Indians,** Algonquian tribe, related to the Illinois, first living in s.e. Wis., then in s. Mich. and Ohio; cede lands to U.S., **3452.**

**Miami** or **Great Miami River,** rises in w. center of Ohio, flows s. to Ohio R.; 140 mi. long; Dayton flood, **970.**

**Miami University,** at Oxford, Ohio; co-ed.; founded 1809; liberal arts and normal colleges; **2572.**

**Mi'ca,** a mineral, **2219;** called "isinglass," **1409.**

**Micah** (*mī'kà*) (about 757–700 B.C.). One of Hebrew minor prophets, contemporary of Isaiah; author of 33d book of Old Testament.

**Mica schist.** A metamorphic rock composed chiefly of mica and quartz; divides readily into slabs.

**Micaw'ber, Wilkins.** In Dickens' 'David Copperfield', an unpractical optimist who is always waiting for "something to turn up"; supposed to be drawn from Dickens' father.

**Michael** (*mī'kĕl*), warrior archangel (Rev. xii, 7); in Milton's 'Paradise Lost', **2246.**

**Michael and St. George, Order of St., 979.**

**Michaelmas.** The feast of St. Michael, Sept. 29.

**Michaelmas daisy, 237.**

**Michael Obrenovitch** (*ō-brĕn'ō-vĭch*) **III** (1823–68). Prince of Serbia; succeeded 1840, deposed 1842, restored 1860; secured withdrawal of Turkish troops from Serbia; assassinated by Karageorgevitch supporters.

**Michelangelo** (*mī-kĕl-ăn'ĝĕ-lō*) **Buonarroti** (1475–1564), Ital. sculptor, painter, architect, and poet, **2220–2, 3158;** 'Descent from the Cross', *picture,* **2220;** façade of Palace of Senators, *picture,* **3051;** 'Moses', *picture,* **2222;** method of work, **3154;** paintings of the Sibyls, **3229;** praises Ghiberti's doors, **1456;** statue of David, **1850, 2222;** statue of Giuliano de' Medici, *picture,* **3159;** work in Vatican, **3054, 3055.**

**Michelet** (*mēsh-lā'*), **Jules** (1798–1874). Fr. historian, learned and interesting, but partisan and uncritical ('Histoire de France').

**Michelson** (*mī'kĕl-sŏn*), **Albert Abraham** (born 1852), Amer. physicist and educator, b. Germany; investigator of light phenomena; since 1892 head of dept. of physics at U. of Chicago; invents echelon spectroscope, **3314,** interferometer, **1998, 3344;** measures speed of light. **1998;** wins Nobel prize (1907), **2512.**

**Michigan** (*mĭsh'ĭ-ĝăn*), a n.-cent. state of U.S.; 57,980 sq. mi.; pop. 3,668,412; cap. Lansing; **2223–7,** *maps,* **2226, 1511, 3584–5;** agriculture, **2224;** automobile industry, **2224, 999;** cement, **676;** chief cities and manufactures, **2224, 2225, 999, 1497;** climate **1510;** copper, **2223, 881, 882, 883;** dunes, **3121, 3122;** fruit-growing, **2224, 161,** *picture,* **2223;** furniture, **2224, 1497;** history, **2226–7, 2529, 2572;** iron ore, **2223, 1513, 1817;** meaning of name, **3347;** origin of nickname, **3776;** state flower, **3347;** summer resorts, **1512,** *picture,* **1514;** Upper Peninsula, **2226, 1513.**

**Michigan, Lake,** 3d largest of Great Lakes (22,400 sq. mi.), **2227, 1510–4,** *map,* **1511;** Drainage Canal, **627;** dunes, **3122,** *pictures,* **3123, 1759;** fisheries, **1286, 3770;** tides, **3498.**

**Michigan, University of,** at Ann Arbor, Mich.; co-ed.; state control; chartered 1837, opened 1841; arts and science, engineering and architecture, medicine and surgery, law, pharmacy, dentistry; **2227,** *picture,* **2225.**

**Michigan Agricultural College,** at East Lansing, Mich.; co-ed.; state control; chartered 1855, opened 1857; agriculture, engineering, home economics, forestry, veterinary medicine; state experimental station; **2227.**

**Michigan Boulevard,** Chicago, *pictures,* **721, 724.**

**Michigan City,** Ind. Mfg. city and port on L. Michigan 40 mi. e. of Chicago; pop. 19,457; large trade in lumber, salt, and iron ore; knit goods, furniture, iron products, cars; northern Indiana state prison.

**Michigan College of Mines.** At Houghton, Mich.; men; state institution; founded 1885, opened 1886; practical work in mine surveying and mining, science.

**Michoacan** (*mē-chō-ä-kän'*), state in s. Mexico on Pacific; 22,621 sq. mi.; pop. 1,004,000; cap. Morelia; minerals, **2210, 2211.**

**Mickiewicz** (*mĭts-kyā'vĭch*), **Adam** (1798–1855), greatest of Polish poets; chiefly famous for epics based on the folk tales and legends of his nation ('Pan Tadeusz'; 'Dziady'; 'Grazyna'); **2858;** burial place, **914.**

**Microbes** (*mī'krōbz*), a popular name for bacteria, **1450.** *See also in Index* **Bacteria.**

**Microm'eter, 2227;** used in telescopes, **3463.**

**Mi'cron,** a scientific unit of measurement (symbol μ), **303, 2230.**

**Micronesia** (*mī-krō-nē'shĭ-ä*), a collection of small isl. groups in Pacific, **2620,** *map,* **2624–5.**

**Mi'cro-or'ganisms, 1449.** *See also in Index* **Bacteria; Protozoa.**

**Mi'crophone, 3233, 1316.**

**Mi'croscope, 2228–30;** lenses, **2228, 1986–8, 1474;** photography with, **2783, 2342,** *pictures,* **474.**

**Mi'das,** in Gk. myth., king of Phrygia who was given golden touch, **2230.**

**Mid-Continent oil field, 2754.**

**Middle Ages, 1654,** history chart, **1658–9;** agriculture, **48,** *picture,* **44;** architecture, **181–8, 662;** armor, **214–6;** Roger Bacon, **301;** Black Death, **433;** books and libraries, **455–6, 1992;** castles, **654–7;** Christian church, **763;** growth of cities, **769–70, 373, 1358;** commerce, **1576, 904, 372–3, 376;** origin of corporations, **893;** costumes, **898;** education, **831–2, 2608, 763, 2, 2608;** enamels, **1146;** fairs and markets, **1219–20;** falconry, **1220, 1606;** feudal system, **1235–6;** floor coverings, **3079;** footwear, **3220–1;** Froissart, **1375;** gilds in, **1459–60;** hats and caps, **1598;** heating of houses, **3368;** heraldry, **1639;** hour-glasses and clocks, **797;** house furnishings, **1383;** three revolutionary inventions, **773;** ivory sculptures, **1854;** knighthood, **1933–5;** libraries, **1992;** literature, **1337–8, 2539, 3039;** Marco Polo, **2874;** miracle and mystery plays, **1033, 2259;** milling, **1301;** monks and monasticism, **2298–2302;** ordeals and other forms of trial, **1905;** pageant, **2625;** painting, **2628–9;** pilgrims, **2807;** prisons and punishments, **2918–9;** roads, **3023–4;** Robin Hood, **3028–33;** Saracen conquests, **2278;** serfdom, **3249;** sewage disposal, **3183;** ships, **3208;** 'Song of Roland', **3038;** spice and sugar trade, **3317, 3385, 2723;** superstitions, **849, 1027;** stained glass, **1474;** table utensils, **1937;** tapestries, **3433–4, 1140;** water supply, **3702;** writing, *picture,* **2710.**

*See also in Index* **Feudal system; Gilds; Knighthood and chivalry.**

**Middlebury College.** At Middlebury, Vt.; co-ed.; founded 1800; classical, scientific, and pedagogical courses.

**Middle English, 1162.**

**Middle Park,** a mountainous plateau in cent. Colo., **841.**

**Middlesbrough** (*mĭd'lz-brŭ*). Seaport and mfg. city on Tees R. in n.e. England; pop. 132,000; center of large iron and coal dist.

**Middlesex,** England. Small inland county n. and w. of London; 283 sq. mi.; 50 sq. mi. now included in administrative county of London; pop. 1,253,000.

**Middleton, Thomas** (1570?–1627), Eng. dramatist; collaborated with William Rowley and others ('The Spanish Gipsy'; 'The Changeling'; 'A Fair Quarrel'); **1034.**

**Middletown,** Conn. Industrial center in fruit and tobacco-growing region on Connecticut R., 15 mi. s. of Hartford; pop. 13,638; connected by drawbridge with opposite town of Portland, known for its brownstone quarries; Wesleyan Univ.

**Middletown,** N.Y. Industrial and r.r. city, 50 mi. n.w. of New York City; pop. 18,420; in stock-raising, gardening, and dairying dist.; men's hats, saws and files, machinery, etc.; important in early days because of location between Hudson and Delaware rivers on old Minisink road.

**Middletown,** Ohio. Industrial and r.r. city on Miami R. 28 mi. n. of Cincinnati; pop. 23,594; paper, steel, and tobacco products.

**Middlings,** in flour milling, **1303.**

**Mid'gard.** In Norse myth., the Earth.

**Midgardsorm** or **Midgard serpent,** in Norse myth., serpent encircling the earth, **2560, 3492.**

**Midges,** small flies, **1313.**

**Mid-iron,** a golf club, *picture*, **1486.**

**Midland College.** At Atchison, Kan.; co-ed.; Luth.; founded 1887; arts and science, music.

**Midland counties.** A name applied collectively to most of the interior counties of England.

**Midlo'thian.** *See in Index* **Edinburghshire.**

**Midnight sun,** in Norway, **2529, 2530, 2534;** in Sweden, **3401.**

**Midshipmen,** in U.S. Navy, **2418–9, 2426.**

**Midsummer Day,** Scandinavian holiday, **3357, 3401.**

**'Midsummer Night's Dream',** comedy by Shakespeare, **1164;** story of, **2230.**

**"Mid-Victorian," 3639.**

**Midway Islands,** group of the Hawaiian Isls. (U.S.), so called because they are midway between Asia and America, **2624;** cable, **561.**

**Mifflin, Thomas** (1744–1800). Amer. general and politician, b. Philadelphia; as colonel, first aide-de-camp to Washington, and leader of "Conway Cabal" to remove him; U.S. senator, governor of Pa.

**Mignonette** (*mĭn-yŏn-ĕt'*), a flowering plant, **2230.**

**Migration,** of animals, **2231–4;** armyworms, **218–9;** arctic tern, **1549, 2231;** birds, **2231–2, 404, 401;** bobolink **446, 2231;** buffalo, **430;** crabs, **914;** cranes, **3365,** *picture*, **3363;** eels, **1089;** goose, **1488;** hummingbirds, **1698;** lemmings, **2234,** *picture*, **2233;** locusts, **1504, 1506;** golden plover, **2839, 2231–2;** rails, **2961;** robins, **3028;** salmon, **3113;** swallows, **3398;** swifts, **3399.**

**Miguel** (*mē-gāl'*), **Dom Maria Evaristo** (1802–66). Portuguese prince and pretender, 3d son of John VI, whom he tried to dethrone, and uncle of Maria da Gloria, whose throne he usurped (1828–34).

**Mikado** (*mĭ-kä'dō*), the emperor of Japan, **1868;** restored to power, **1862;** palace at Tokyo, **3511.**

**'Mikado',** comic opera, **2584.**

**Milan** (*mĭ-lăn'*), 2d largest city of Italy; pop. 665,000; **2235;** cathedral, **1844–6, 2235,** *pictures*, **1843, 1199;** war of Charles V and Francis I, **1354.**

**Milan, Edict of** (313 A.D.), **870.**

**Milan** (*mē'län*) **Obrenovitch IV** (1854–1901). Prince of Serbia; succeeded 1868; secured Serbian independence and became king 1882; abdicated 1889 in favor of his son, Alexander I.

**Milazzo** (*mē-lät'sō*), Sicily. Same as **Mylae.**

**Mil'dews and molds, 2235–6, 1382.**

**Mile,** a unit of measure, **3715;** origin of name, **3714;** nautical, how measured at sea, **2045.**

**Miles, Nelson A.** (born 1839), Amer. soldier, b. Westminster, Mass.; in Civil War rose from lieut. to maj.-gen.; fought at Chancellorsville, Antietam, Fredericksburg, Richmond, and received Congressional Medal of Honor; later famous Indian fighter, captor of chiefs Joseph and Geronimo; after 1895 to his retirement 1903 senior officer commanding U.S. Army (lieut.-gen. by act of Congress 1900); subdues Apaches, **2467.**

**Miles City,** Mont. Trade center of Mont. cattle and farming dist., 135 mi. n.e. of Billings on Yellowstone R.; pop. 7937; r.r. shops, stockyards, wool warehouses, oil refineries.

**Miletus** (*mī-lē'tŭs*), great maritime city and republic on Aegean Sea in anc. Ionia, Asia Minor; colonizer and center of learning; stormed and sacked by Persians 494 B.C. for leading Ionian revolt; *map*, **27.**

**Milford,** Conn. Industrial town on Long Island Sound; pop. 10,193; at mouth of Wepowang R., 10 mi. s.w. of New Haven; oyster cultivation, farming, seed-growing; straw hats and metal mfrs.

**Milford,** Mass. Town on Charles R., 17 mi. s.e. of Worcester; pop. 13,471; iron and steel products, silk, shoes, thread, hats, rubber goods; large granite quarries near.

**Mil'itary Academy, United States, 2236–8;** cadet's uniform, **3578.**

**Military Intelligence Bureau,** U.S., **3599.**

**Military Order of the Loyal Legion, 2695.**

**Militia** (*mĭ-lĭsh'ȧ*), in U.S., state military bodies forming a part of the National Guard; police duties, **2866;** in Amer. Rev., **3002, 3003.**

**Militia Bureau,** U.S., **3599.**

**Milk, 2238–9;** Babcock test for butter-fat, **950, 3770;** casein, **2239, 709, 2926;** certified, **952–3;** cheese-making, **709, 952;** condensed, **2239;** dairying, **949–53;** how digested, **1011;** evaporated, **2239;** food value, **1320, 1321, 1322, 2239;** of goats, **1476, 1477;** malted, **2131, 2239;** pasteurized, **953, 2692;** powdered, **2239;** protein in, **2926, 2239;** secreted by glands, **1469, 1470;** why it sours, **1232;** substitute fluid obtained from trees, **3532;** sugar in, **2239, 3388;** vitamins, **3651, 3652, 2239;** yak, **3827;** yield of good cow, **663, 950,** *picture*, **952.**

**Milk gallon,** a unit of measure, **3715.**

**Milk of magnesia,** milky solution of magnesium hydroxide in water, **2121.**

**Milk of sulphur, 3390.**

**Milk River,** Mont., tributary of Missouri, 500 mi. long, *map*, **2309.**

**Milk snake** or **house snake.** A harmless common snake of N. America about 4 ft. long or less; so named because it seeks places where milk is kept, though it has not been proved that it drinks milk; mice are its chief food.

**Milk sugar,** or lactose, **2239, 3388.**

**Milk teeth, 3452,** *pictures*, **3453.**

**Milkweed,** family of plants, **3712.**

**Milkweed butterfly,** color plate facing **548;** egg, *picture*, **1091.**

**Milky Way, 3341,** *picture*, **3343;** nebulae, **2432;** Galileo's telescope, **1391.**

**Mill, James** (1773–1836). Eng. philosopher and economist, whose strong personality and brilliant conversation added to influence of his books ('History of British India'; 'Analysis of the Human Mind', his greatest work); father of John Stuart Mill.

**Mill, John Stuart** (1806–73), Eng. philosopher, economist, scholar, and enthusiastic democrat; exercised immense influence on contemporary thought; empiricist in philosophy, utilitarian in ethics; attitude in Amer. Civil War, **781;** and Carlyle, **644;** George Eliot, **1134;** Emerson, **1141;** and Fabre, *picture*, **1217;** 'Principles of Political Economy', **1078;** on women's rights, **3778.**

**Millais** (*mĭl-lā'*), **Sir John Everett** (1829–96), Eng. painter ('The Huguenot'; 'Eve of St. Agnes'; 'Chill October'; 'Cherry Ripe'); one of Pre-Raphaelites, **2632.**

**Millay, Edna St. Vincent** (born 1892). Amer. poet and dramatist, b. Rockland, Maine ('Renascence'; 'Second April'; 'The Lamp and the Bell').

**"Mill-boy of the Slashes," 785.**

**Mil'ledgeville,** Ga., town 30 mi. n.e. of Macon; pop. 4619; state cap. 1807–67; seized by Gen. Sherman (1864); Georgia Military College; cotton, clay products; secession convention, **3353.**

**Mille Lacs** (*mēl lăk*), lake in cent. Minnesota, 16 mi. long, *map*, **2254.**

**Millen'nium.** The kingdom of Christ on earth, period of 1000 years preceding the Last Judgment; belief in it is based on Rev. xx, 1–5.

**Miller, Henry (John)** (born 1860). Amer. actor, b. London, England; early performances with Mme. Modjeska and Adelaide Neilson; later star in many plays, including 'Heartsease', 'The Only Way', and 'The Great Divide'.

**Miller, Joaquin.** Pen name of Cincinnatus Heine Miller (1841–1913), Amer. western poet, b. Indiana; his poetry more noteworthy for "genuinely romantic content and brilliant if crude color than for artistic excellence" ('Songs of the Sierras'; 'Songs of the Sunlands'; 'Songs of the Mexican Seas').

**Miller, Lewis** (1829–99), Amer. inventor, manufacturer, and philanthropist, b. Greentown, Ohio; active in Sunday School movement; helps found Chautauqua, **707.**

**Millerand** (*mēl-răn'*), **Alexandre** (born 1859). Fr. premier, later president (1920); former socialist; instrumental in securing much recent Fr. social legislation; minister of war 1914–15.

**Millesimo** (*mĭl-lā'sē-mō*), Italy. Village 35 mi. w. of Genoa; Napoleon defeated Austrians 1796.

**Millet** (*mē-yā'*), **Jean François** (1814–75), Fr. painter of peasant life, **2239–40, 2632;** 'The Angelus', *picture*, **2638.**

**Mil'let,** any of various cereal grasses with small grains borne on spikes or panicles, **2239;** includes many sorghums, **3276;** in India, **1751.**

**Mil'ligram,** unit in metric system (0.015 grain), **2206.**

**Millikin University.** *See in Index* **James Millikin University.**

**Mil'liliter,** unit in metric system (0.27 fluid drams), **2206.**

**Mil'limeter,** unit in metric system (0.03937 inch), **2206.**

**Milling,** of coins, **2258, 2281.**

**Milling machines,** for working wood and metal, **3514, 3516,** *picture,* **3514.**
**Mil'lipede** or "thousand legs," a many-legged arthropod, **3946, 3325.**
**'Mill on the Floss, The',** novel by George Eliot, **2540, 1134.**
**Mills, Enos A.** (1870–1922), Amer. naturalist, b. Kansas City, Kan. (articles urging protection of birds and wild flowers, and establishment of national parks; 'Wild Life in the Rockies'; 'Rocky Mountain Wonderland'); **841.**
**Mills, Roger Quarles** (1832–1911). Amer. politician, b. Todd County, Ky.; member of Congress from Tex. 1873–92; as chairman of Ways and Means Committee introduced Mills Bill; U.S. senator 1892–99.
**Mills, flour.** *See in Index* **Flour and flour-milling.**
**Millsaps College.** At Jackson, Miss.; co-ed.; Meth. Episc. church, South; founded 1892; arts and science.
**Mills Bill, 790.**
**Mills College.** At Mills College, Alameda County, Calif.; women; non-sect.; chartered 1885 (Mills Seminary for Young Women, 1871); arts and science, home economics, physical training.
**Mill Springs,** Ky. Village 50 mi. s. of Danville, where opening battle of Ky.-Tenn. campaign in Civil War was fought Jan. 18, 1862; Gen. George H. Thomas and Gen. George B. Crittenden commanded; Confederates retreated.
**Millstones, 1301,** *picture,* **1302.**
**Millville,** N.J. Mfg. city 40 mi. s. of Philadelphia at head of deep-water navigation on Maurice R.; pop. 14,691; glass products from glass-sand obtained near by; textile and knitting mills.
**Milman, Henry Hart** (1791–1868). Eng. churchman, historian, and poet; dean of St. Paul's, London ('History of Latin Christianity').
**Milner, Alfred, Viscount** (born 1854). Brit. statesman and colonial administrator; won international fame as high commissioner for S. Africa 1897–1905, period which laid permanent foundations of Brit. rule there; an imperialist and conservative, he opposed famous Lloyd George budget of 1909, but joined coalition cabinet 1916 and except Lloyd George himself took largest share in civilian war activities; sec. of state for colonies 1919.
**Milo** (*mī'lō*) or **Milon** (6th cent. B.C.). Gk. athlete; crowned 6 times at Olympic Games and 6 times at Pythian for wrestling; carried an ox through stadium.
**Milo.** *See in Index* **Melos.**
**Milo maize,** a sorghum, **3276.**
**Milosh Obrenovitch** (1780–1860), prince of Serbia, born a peasant; for services in freeing Scrbia from Turkish rule called "father of his country"; **3177.**
**Miltiades** (*mĭl-tī'ă-dēz*) (d. 488? B.C.), Athenian general, victor over Persians at Marathon (490 B.C.), **2739, 195.**
**Milton, John** (1608–74), Eng. poet, **2240–3, 1165,** *picture,* **1165;** quoted, **1624, 2982;** story of 'Paradise Lost', **2244–6;** his vocabulary, **1162.**
**Milton,** Mass., residential suburb 7 mi. s. of Boston; pop. 9382; **472.**
**Milton College.** At Milton, Wis.; co-ed.; Seventh-Day Bapt.; established 1844 and chartered as a college 1867.
**Milvian** (*mĭl'vē-ăn*) or **Mulvian Bridge,** anc. bridge over Tiber on Flaminian Way where Maxentius was drowned following his defeat by Constantine 312 A.D., **870.**
**Milwau'kee,** Wis., largest city of state; pop. 457,147; **2246–7, 3771;** cement, **676.**
**Milwaukee-Downer College,** at Milwaukee, Wis.; non-sect. institution for women founded 1895 by the union of Milwaukee College (founded 1851) and Downer College (founded 1855); letters and science, music, home economics, art, occupational therapy; **2247.**
**Milwaukee River,** in Wis., 100 mi. long; enters L. Michigan, **2246.**
**Milyukoff** (*mĭl-yų-kŏf'*), **Paul** (born 1859). Rus. historian and statesman, leader of Constitutional Democrats in Rev. of 1917 and minister for foreign affairs in Lvoff ministry.
**Mime** (*mīm*), a play, **1033.**
**Mim'icry,** among animals. *See in Index* **Protective coloration and resemblance.**
**Mimic thrushes, 3493, 2275.**
**Mim'idae,** mocking-bird family, **412, 2275, 3493,** *picture,* **419.**
**Mimir** (*mē'mir*), old giant in Norse myth., **2560.**
**Mimner'mus** (7th cent. B.C.). Gk. elegiac poet, the first to make elegiac verse a vehicle for love-poetry.
**Mimo'sa,** any of various shrubs or trees of the bean family with sensitive leaves, **3174;** bark used in tanning, **1976;** name sometimes applied to wattles.
**Mims, Fort.** *See in Index* **Fort Mims.**
**Mi'na,** village near Mecca, Arabia, **2187.**
**Min'arets,** slender towers of mosque, provided with balconies from which are issued the calls to prayer, *picture,* **2276.**
**Minch,** strait separating Hebrides from n.w. coast of Scotland, **1625,** *map,* **1159.**
**Mind, 2247;** brain, **486–92;** in lower animals, **130–1;** phrenology, **2784;** psychology the science of, **2930–1.** *See also in Index* **Psychology.**
**Mindanao** (*mēn-dä-nä'ō*), southernmost and 2d largest isl. of Philippines; 36,906 sq. mi.; **2764,** *map,* **1073;** Moros in, **2766.**
**Mind-cure** or mental therapy. **2193.**
**Min'den,** Germany. Old town in w. on the Weser R. 55 mi. s. of Bremen, near which English and Prussians defeated French (1759) in Seven Years' War.
**Mind-reading,** based on telepathy, 1718.
**Mineral'ogy,** defined, **2247.**
**Mineral oils, 1225;** petroleum and its derivatives, **2749–55.**
**Mineral paints,** pigments derived from minerals, **2642.**
**Minerals, 2247–8;** Australia, **264, 2471, 3638;** Africa, **41, 3283;** Alaska, **74, 75;** Canada, **610;** crystalline and amorphous forms, **935;** diamond the hardest, **1002;** Europe, **1192, 647, 3607;** France, **1348;** Germany, **1443;** N. Amer., **2516;** in ocean, **2554;** silicates abundant, **3233;** S. Amer., **3289, 123;** Spain, **3302;** talc the softest, **3430;** U.S., **3590, 3583,** *graph,* **3585.** *See also in Index* **Mines, and mining;** and the various minerals and political divisions by name.
**Mineral salts,** in food, **1320, 1010–1, 2239;** needed by plants, **2824, 2826.**
**Mineral springs, 3301;** Ark., **207,** *picture,* **209;** Ind., **1760;** Ozark Mts., **2616;** Saratoga Springs, **3126;** Va., **3648;** Waukesha, Wis., **3771;** W. Va., **3720;** Yellowstone Park, **3830,** *picture,* **3829.**
**Mineral wool, 1472.**
**Miner bees, 363, 364.**
**Miner'va,** in Rom. myth., goddess of wisdom, identified with Gk. Athena, **2248, 248–9.** *See also in Index* **Athena.**
**Mines, Bureau of,** U.S., **2251;** radium production, **2960.**
**Mines, submarine, 3517–20.**
**Mines and mining, 2248–51;** acetylene lighting in, **8;** "choke damp", or carbon dioxide, **642;** coal, **2250, 814,** *pictures,* **812, 813, 815, 2249;** copper, **881–2, 3610,** *picture,* **3611;** Davy's safety lamp, **969;** deepest mine, *picture,* **51;** diamond, *pictures,* **1002, 1003;** dredging, **1040,** *picture,* **1039;** gold, **1479–80,** *pictures,* **78, 265, 1479, 1480, 2249, 1039;** hydraulic, **1480,** *pictures,* **78, 1300;** iron, **1817, 1820,** *pictures,* **1816, 2255;** placer mining, **1479–80,** ling for oil, **2750, 2752–3;** schools, **2251, 3654;** sulphur, **3389.**
**Ming dynasty,** the ruling dynasty in China 1368–1644; cap. and tombs at Nanking, **2389;** Peking tombs, **2708,** *picture,* **739.**
**Minho** (*mē'nyō*), a r. forming part of n. boundary of Portugal, 170 mi. long, *map,* **3300.**
**Minié** (*mĭn'i-ā*) **ball,** a bullet, **1254.**
**Min'imum wage,** lowest wage which will secure to the worker and dependents physical efficiency and social decency; covers least cost of clothing, food, shelter, and medical care as determined by existing prices; some states of U. S. and foreign countries have boards to fix this wage, with more or less authority to compel employers to pay it; in Australia, **269.**
**Min'ion type, 3572.**
**Ministers,** in diplomatic service, **1012–3.**
**"Minister's Cat,"** game, **2837.**
**Minitari** (*mē-nē-tä'rē*) **Indians.** Same as **Gros Ventres.**
**Min'ium,** or red lead, **1973.**
**Mink,** animal related to weasel, **2251;** breeding, **1389;** fur, **1390.**
**Minneap'olis,** Minn., largest city of state; pop. 380,582; **2252;** early history, **2265, 1632;** flour mills, **1304,** *pictures,* **1301, 2255;** Gateway Park, *picture,* **2256;** street scene, *picture,* **2256;** state univ., *picture,* **2253.**
**Minnehaha** (*mĭn-ē-hä'hä*) ("Laughing Water"), maiden loved by Hiawatha, **2060.**
**Minnehaha Falls,** at Minneapolis, Minn., **2252.**
**Min'nesingers,** medieval Ger. lyric poets, **2378.**
**Minnesongs, 1436.**
**Minneso'ta,** a state in n.-cent. U.S.; 84,287 sq. mi.; pop. 2,387,125; **2252–7,** *maps,* **2254, 3584–5;** agriculture **2253–4;** cap. St. Paul, **3111;** cities and mfrs., **2254, 2255;** climate, **3587, 2252–3;** Duluth, **1047;** history, **2257, 1632, 3111;** iron ore production, **2254, 1817, 1820,** *pictures,* **1816, 2255;** iron ore traffic, **1513,** *map,* **1511;** L. Agassiz, **1721, 2986;** meaning of name, **2252;** Minneapolis, **2252;** Mississippi R., **2265–6, 2268;** Red R., **2986;** state flower, **3347;** surface features, **2252–3.**
**Minnesota, University of,** at Minneapolis, Minn.; co-ed.; state control; established 1851 (present charter 1868); arts and science, music, law, medicine, dentistry, chemistry, engineering and architecture, agriculture, school of mines, education; Folwell Hall, *picture,* **2253;** Mayo Clinic, **2256, 1687.**
**Minnesota River,** tributary of Mississippi (450 mi. long), **3111,** *map,* **2254.**
**Minneton'ka Lake,** near Minneapolis, Minn., **2252.**
**Mino'an Age, 28.**
**Minorca** (*mi-nôr'kà*), 2d largest of Balearic Isls.; 260 sq. mi.; fine harbor at Port Mahon; **307,** *map,* **3300.**
**Minorca,** a breed of fowls, **2911,** *picture,* **2909.**
**Minorites.** Same as **Franciscans.**
**Minos** (*mī'nŏs*), in Gk. myth., king and lawgiver of Crete, son of Zeus and Europa, father of Ariadne; after his death, judge in underworld; legend of Cretan bull, **1640;** name given to Minoan Age, **28;** Minotaur myth, **3487, 949;** palace ruins, **918.**

**Mi'not,** N.D., trade center on Mouse R. 200 mi. w. of Grand Forks; pop. 10,476; coal mining, flour milling, and mfr. of briquettes; **2525.**
**Minotaur** (*mĭn'ō-tạr*), in Gk. myth., bull-headed man-monster, eater of human flesh; imprisoned by Minos in Cretan labyrinth; **3487, 918, 949.**
**Minot's Ledge lighthouse, 2004,** *picture,* **469.**
**Min River,** s.c. China, entering Formosa Strait; navigable in lower course; **1319.**
**Minsk** (*mēnsk*). City in w. Russia 400 mi. s.w. of Petrograd; pop. 118,000; cap. of govt. of same name.
**Minster,** monastery church, origin of term, **2299.**
**Minstrels,** medieval bards, **2377–8, 2504;** romances, **3039.**
**Mint,** a genus of herbs, **2257–8, 3318.**
**Mint, U. S., 2258–9.**
**Mintha,** nymph in Gk. myth., **2257.**
**Min'to, Gilbert J. Elliott-Murray-Kynynmond, Earl of** (1845–1914). Gov.-gen. of Canada 1883–85 and viceroy of India 1905–10.
**Minuet** (*mĭn-yụ-ĕt'*), old-fashioned dance music in triple measure; in sonata, **2379.**
**Min'uit** or **Minnewit, Peter** (1580–1641). Colonial official for Dutch and Swedish West India Companies; purchased Manhattan Isl. from Indians and built Fort Amsterdam 1626; founded New Sweden and built Fort Christina 1638 on site of Wilmington, Del.
**Minute** (*mĭn'ĭt*), in measurement of angles, **1424.**
**Minute,** why divided into 60 seconds, **295.**
**Minutemen,** Amer. colonial militia; at Lexington and Concord, **1990.**
**Miocene** (*mī'ō-sēn*) **period,** in geologic time, **1418,** *picture,* **1419.**
**Miquelon** (*mē-kĕ-lôn'*). Fr. isl. group near s. coast of Newfoundland; 83 sq. mi.; cod fisheries.
**Mir** (*mēr*), Rus. village community, **3087.**
**Mirabeau** (*mē-rä-bō'*), **Count Honoré Gabriel Riqueti** (1749–91), Fr. Rev. statesman, **2259.**
**Miracle-plays,** religious plays of Middle Ages, **2259, 1033.**
**Miraflores** (*mē-rä-flō'rās*) **Locks,** in Panama Canal, **2663,** *picture,* **2659,** *map,* **2662.**
**Mirage** (*mē-räzh'*), an optical illusion, **2260–1.**
**Miramichi** (*mĭr-à-mē-shē'*) **River,** 2d largest r. of New Brunswick; abounds in fish; logging, *picture,* **606.**
**Miran'da,** in Shakespeare's 'Tempest', daughter of Prospero, **3465.**
**Miranda, Francesco** (1756?–1816), Span.-Amer. revolutionist, **3622.**
**Mir'iam.** Hebrew prophetess, sister of Moses (Exod. ii; xv, 20).
**Mir Jaffa** or **Jaffir,** Indian general and ruler, **796.**
**Mirror galvanometer, 557–8.**
**Mirrors, 2261;** concentrate radiant heat, **1620.**
**'Misérables, Les'** (*lā mē-zā-rä'bl*) (The Unfortunates), novel by Victor Hugo, **1694;** story of Jean Valjean, **1695–6.**
**Mishawa'ka,** Ind. Mfg. center 4 mi. e. of South Bend on St. Joseph R.; pop. 15,195; automobiles, machinery, trunks, rubber goods, furniture.
**Mish'na,** part of Talmud, **1625.**
**Misquah Hills,** elevated region containing highest point in Minn. (2230 ft.), **2252.**
**Missel-thrush, 3494.**
**"Missing link," 153.**
**Mission architecture, 189;** example, *picture,* **581.**
**Missionary Ridge, battle of** (Nov. 25, 1863), **700–1;** Sheridan at, **3204.**
**Mission Mts.** Range in w. of Mont.
**Missions, Christian:** apostles, **157;** St. Boniface, **454;** Burma, **541;** Constantinople, **3561;** Franciscan, **2300, 1355;** Grenfell, **1541–2;** Japan, **1868, 1869, 3823;** Korea, **1944;** Livingstone; **2033–5;** Loyola, **2075;** N. Amer. Indians, **202, 580, 587, 1632, 2151, 2598;** Pacific Isls., **2624, 1705;** St. Patrick, **2695;** St. Paul, **2698;** St. Peter, **2745;** S. Amer., **3289;** Xavier, **3823.**
**Mississippi,** a gulf state of U.S.; 46,865 sq. mi.; pop. 1,790,618; cap. Jackson; **2261–4,** *maps,* **2262, 3584–5;** history, **2264, 3637, 857, 780;** industries and products, **2262, 2264;** meaning of name, **3347;** Mississippi R., **2266, 2268;** physical features, **2261–2;** state flower, **3347;** Vicksburg, **3637.**
**Mississippi, University of.** At Oxford, Miss.; co-ed.; chartered 1844, opened 1848; liberal arts, science, engineering, pedagogy, medicine, law, pharmacy.
**Mississippian period,** in geology, **1418.**
**"Mississippi Bubble," 2072.**
**Mississippi Highway, 3024.**
**Mississippi River,** greatest r. of N. Amer. and, including Missouri, the longest in the world (4200 mi.), **2265–8, 3582;** cotton steamer, *picture,* **901;** drainage basin, **2792, 2266;** exploration, **2265, 999, 2151, 1900, 1632, 1964;** Falls of St. Anthony, **2252, 2256, 2265;** fish, **1283;** jetties, **1888;** Keokuk dam, **1804,** *picture,* **1805;** L. Pepin, *picture,* **2253;** levees, **2268, 2068, 2262, 2469;** head of deep-water navigation at Memphis, **2198,** *picture,* **3466;** mussel fisheries, **1806, 549;** New Orleans trade, **2468–71;** St. Louis bridges and barge lines, **3109;** St. Paul head of navigation, **3111.**
**"Mississippi Sea," 2516.**
**Mississippi Valley, 2515, 2516, 3582, 723, 888.**
**Missolonghi** (*mĭs-ō-lŏn'gē*) or **Mesolonghi.** Town in w. Greece on Gulf of Patras; pop. 11,000; brilliantly defended against Turks in War of Liberation 1822–26; scene of Byron's death.
**Missou'la,** Mont., center of lumbering, mining, and agricultural region, on Missoula R.; 95 mi. n.w. of Helena; pop. 12,668; **2312;** state univ. building, *picture,* **2311.**
**Missouri** (*mĭ-zụ'rĭ*), a n.-cent. state of U.S.; 69,420 sq. mi.; pop. 3,404,055; cap. Jefferson City; **2269–73,** *maps,* **2270, 3584–5;** agriculture, **2270, 161, 2196;** climate, **2269–70;** Kansas City, **1912–3;** immigration, **2272, 1913;** manufactures and trade, **2272, 1912–3, 3109–10;** meaning of name, **3347;** minerals, **2270, 2272, 3839;** Mississippi R., **2265–8;** Missouri R., **2273–4;** St. Louis, **3109–10;** state flower, **3347;** surface features, **2269, 2616.** —*History,* **2272–3, 3110;** influence of Benton, **382, 384;** Missouri Compromise, **2273;** Mormons in, **2326.**
**Missouri, University of,** at Columbia, Mo.; co-ed.; state control; established 1839, opened 1841; arts and science, agriculture, education, law, medicine, engineering, mining, journalism, business and public administration, forestry, horticulture; *picture,* **2271.**
**Missouri Compromise, 2273, 2272, 777;** Clay's part, **786;** declared unconstitutional in Dred Scott decision, **1039;** Kansas-Nebraska Act repeals, **1913.**
**Missouri River,** chief tributary of Mississippi (2456 mi.), **2273–4, 3582;** junction with Mississippi, **2266;** Lewis and Clark explore, **1989;** sediment, *picture,* **2267.**
**Missouri Valley College.** At Marshall, Mo.; co-ed.; founded 1889 by Cumberland Presbyterians; liberal arts.
**Missouri Wesleyan College.** At Cameron, Mo.; co-ed., Meth. Episc.; established 1883 as Cameron Institute, present name 1897; arts and science, normal school, commerce, music, civil engineering.
**Mist,** how formed, **809, 1316.**
**Mistassi'ni,** a lake in Quebec near the Height of Land, 120 mi. long, *map,* **602–3.**
**Mis'tletoe,** a parasitic evergreen shrub, **2274, 2680;** how it spreads its seed, **3173;** Norse legend, **306.**
**Mistral** (*mēs-träl'*), **Frédéric** (1830–1914). Fr. poet, leader of Provençal literary revival ('Mireio'); Nobel prize winner 1904; aids Fabre, **1217.**
**Mis'tral,** a cold wind blowing from the Alps, **3751.**
**Mitchell, D. G.,** Amer. essayist. *See in Index* **Ik Marvel.**
**Mitchell, John** (1870–1919). Amer. labor leader, b. Braidwood, Ill., pres. of United Mine Workers of Amer., and vice-pres. of Amer. Federation of Labor; leader of anthracite strike 1901–02; 1914 on N.Y. State Workmen's Compensation Board ('Organized Labor'; 'Boycotts and Labor Struggle').
**Mitchell, Maria** (1818–89). Amer. astronomer and educator; professor at Vassar; made special studies of Jupiter, Saturn, and the Sun; observatory in her memory at Nantucket.
**Mitchell, S. Weir** (1829–1914). Amer. neurologist and novelist; developed "rest cure" for nervous diseases which has been copied throughout the world; wrote many monographs on medical subjects, several volumes of verse, and historical novels of great merit ('Hugh Wynne, Free Quaker'; 'Dr. North and His Friends'; 'The Red City').
**Mitchell,** S.D. Shipping point for farming and lumber region, 68 mi. w. of Sioux Falls; pop. 8500; Dakota Univ. (Meth. Episc.).
**Mitchell, Mt.,** on boundary between N.C. and Tenn., **158, 2518.**
**Mites,** tiny parasitic animals related to spiders, **3946, 3322,** erroneously called insects, **1787.**
**Mitford, Mary Russell** (1787–1855). Eng. novelist ('Our Village'); charming unpretentious sketches from life.
**Mithradates** (*mĭth-rä-dā'tēz*) or **Mithridates, the Great** (132?–63 B.C.), king of Pontus; waged 3 wars against Rome in Asia Minor, exalted in legend for his culture, courage, physical strength, and skill in use of weapons; said to have poisoned himself; **3046, 2878.**
**Mithras** (*mith'rās*). Persian god of sun and truth, whose worship was latest great Asiatic cult imported into Rome before establishment of Christianity; many striking resemblances to Christianity in doctrine and rites.
**Mitrailleuse** (*mē-trä-yûz'*), Fr. machine-gun, **2097.**
**Mi'tral valve,** of heart, **1616.**
**Mitre** (*mē'trā*), **Bartolomé** (1821–1906). "Grand Old Man of the Argentine," soldier and statesman; as pres. 1862–68 carried out constitutional reorganization, fostered internal improvements, and encouraged immigration; formed what is said to be the largest collection of rare Americana in existence.
**Mit'tenwald,** town on the boundary between Austria and Bavaria, **1442.**
**Mitylene.** *See in Index* **Mytilene.**
**Mixture,** in chemistry, **711–2.**
**Mizpah** (*mĭz'pä*) or **Mizpeh.** Name of several places in Palestine; most important Mizpah of Gilead, where Jacob raised heap of stones and made covenant of peace with Laban (Gen. xxxi, 49).
**Mjölnir** (*myûl'nēr*), in Norse myth., hammer of Thor, **3490.**
**Mnemosyne** (*nē-mŏs'ĭ-nē*), in Gk. myth., daughter of Uranus and Gaea, and mother of Muses, **2373.**

**Mniotiltidae** (*nī-ō-tĭl'tĭ-dē*), family of warblers, **3669, 412.**
**Mnium hornum,** a moss, *picture,* **2339.**
**Mo'a,** river in Cuba rising in e. end of Sierra Maestra Mts.; flows into Guantanamo Bay; cascade, **936.**
**Moa,** extinct bird of New Zealand, similar to emu; remains of 20 species found; *picture,* **3443.**
**Moab** (*mō'ăb*) or **Mo'abites,** Semitic tribe living in anc. Palestine e. of Dead Sea and the Jordan; **1890;** Ruth, the Moabite, **3101.**
**Moat** (*mōt*), a ditch often filled with water, around castle, **654,** *picture,* **655.**
**Mo'berly,** Mo. Industrial city 132 mi. n.w. of St. Louis; pop. 12,808; coal and fire clay of the dist. used for bricks, chief product; trade in live stock, hides, tobacco, and farm produce.
**Mobile** (*mō-bēl'*), Ala., scaport and 2d city of the state; pop. 60,777; **2274;** attacked by Farragut, **1225;** settled, **73.**
**Mobile Bay,** Ala., 27 mi. long, 8 mi. wide, **72;** naval battle, **1225.**
**Mobile River,** in s.w. Ala., formed by junction of Alabama and Tombigbee rivers; flows 38 mi. s. to Mobile Bay; **72, 2274.**
**Moc'casin,** Indian shoe, usually made of deerskin or other soft leather; **1770, 1776.**
**Moccasin flower,** or lady's slipper, **1955.**
**Moccasin snake, 2274;** a pit-viper, **3259, 3646–7;** *picture.* **3258.**
**Mocha** (*mō'kä*) or **Mokka,** fortified seaport in Yemen, S. Arabia, on Red Sea; 130 mi. w. of Aden; pop. 5000; coffee, **822, 824;** gives name to Mocha gloves, **1475.**
**Mocha stone,** or moss agate, **2945.**
**Mocking-bird, 2274–5,** *picture,* **419;** often confused with thrasher, **3493;** related to catbird, **660.**
**Mock orange,** or syringa, **3426.**
**Mode,** or mood, of verb, **3627.**
**Model Parliament, 2687, 1087.**
**Modena** (*mō'dā-nä*), city in n. Italy 100 mi. e. of Genoa; cap. of province of Modena; pop. 77,000; fine Romanesque cathedral; famous campanile; univ. founded 1683; joins United Italy, **3638, 1837.**
**Modern history, 1654;** *chart,* **1659–61.**
**Modjeska** (*mō-jĕs'kȧ*), **Helena** (1844–1909). Polish tragic actress on Eng.-speaking stage, best known for Shakespearean rôles (Ophelia, Juliet, Desdemona), first in Polish translations, later in English.
**Mo'doc Indians,** a small warlike tribe closely related to the Klamaths, and originally living in n. Calif. and s. Ore., **2598.**
**Mo'dred, Sir,** King Arthur's nephew and one of knights of Round Table, **3069, 223.**
**Möen** (*mû'ĕn*), Danish isl. in the Baltic Sea between Seeland and Falster; 82 sq. mi.; pop. 14,127; very fertile; agriculture and fisheries; cliffs. **996.**
**Moesia** (*mē'shĭ-ȧ*). Anc. Rom. province s. of Danube R. corresponding to modern Bulgaria and e. Jugo-Slavia; settled by Goths about 376 A.D.; Slavic tribes settled in 6th cent.
**Moffat, Robert** (1795–1883). Brit. missionary in Africa; a colleague of Livingstone.
**Mogok,** town in Upper Burma, India; in valley 4000 ft. high; pop. 11,069; precious stones, **541.**
**Mogul** (*mō-gŭl'*), **Great.** Popular European name of Indian emperors descended from Baber, the first Great Mogul (d. 1530).
**Mogul empire,** in India, **2286, 1752;** and Clive, **796;** Delhi, **990–1;** peacock throne, **2700.**
**Mohács** (*mō'hăch*), market town in n. Jugo-Slavia on Danube R.; pop. 17,092; coal and silk center; formerly in Hungary; two battles, at the beginning and close of Turkish rule of Hungary, **3559, 1703.**
**Mo'hair,** a cloth, **804, 3782, 1476.**
**Moham'med** (567–632), Arabian prophet, founder of Islam, **2275–6,** *picture,* **2277;** Koran, **1942.** *See also in Index* **Mohammedanism.**
**Mohammed II** (1430?–81), sultan of Turkey 1451–81; educated, ambitious, brave, but ruthless; gains Constantinople, **3559, 871.**
**Mohammed V** (1844–1918), sultan of Turkey, **3560.**
**Mohammed VI** (born 1861), sultan of Turkey, deposed 1922 by Nationalist Assembly, **3560.**
**Mohammedanism,** religion founded by Mohammed, **2275–8, 166, 2993, 232, 3558;** in Africa, **37, 38, 3541, 2323, 2328;** architecture, **990–1, 1755,** *pictures,* **990, 569;** Bagdad, anc. cap., **304–5;** in Balkan states, **468;** checked by Charles Martel, **697;** Crusades, **929–32;** customs, **3103, 3078, 1670, 955, 901;** invades Egypt, **1107, 566;** in India, **1748-9, 1752, 1707;** in Java, **1879;** Koran, **1942;** Mecca, holy city, **2186–7, 954;** in Persia, **2736, 2738;** Philippine Isls., **2766;** Saladin, **3111–2;** slavery, **3250, 682;** Spain conquered by Moors, **2323, 3303–4;** in Syria, **3426, 2646;** in Turkey, **3560, 3558–9;** univ. at Cairo, **566,** *picture,* **569;** woman's position, **2736, 2276.**
**Mohave** (*mō-hä'vā*) **Desert,** a desert region lying principally in San Bernardino County, Calif.; part of Colorado Desert, **3580.**
**Mohave Indians.** Same as **Mojave.**
**Mo'hawk,** river in cent. N.Y.; flows e. 175 mi. through fertile valley; **2480, 2482, 2484;** electric power, **2485;** joins Hudson, **1692;** route for early travel, **3581.**
**Mohawks,** leading Indian tribe of Iroquois group, formerly living in lower Mohawk valley, **1766.**
**Mohegans** (*mō-hē'gănz*). Indian tribe of Mohican stock, originally living in Conn., R.I., and Mass.; after destruction of Pequots they were most powerful tribe in s. New England; their name also used as alternative of Mohicans.
**Mohicans** (*mō-hē'kănz*), Indian tribe and confederacy of Algonquian stock originally living in Hudson valley, later in Mass., Conn., and also Pa., where most of them were absorbed into the Delawares, **1765.**
**Moissan** (*mwä-säṅ'*), **Henri** (1852–1907), Fr. chemist; Nobel prize for chemistry in 1906; developed electric furnace for laboratory use and simplified production of acetylene gas; artificial diamonds, **1002.**
**Moisture.** *See in Index* **Humidity.**
**Mojave** (*mō-hä'vā*) (Mohaves), tribe of Yuman stock living along lower Colorado R. in Ariz. and Calif.; agricultural; **1767.**
**Moki Indians.** Same as **Hopi.**
**Mokka.** Same as **Mocha.**
**Molar teeth, 3452,** *pictures.* **3453.**
**Molas'ses,** by-product of sugar, **3386, 3388;** use in candies, **630.**
**Moldau** (*mōl'dou*) or **Ultava River,** in Czecho-Slovakia, rises near s.w. frontier, flowing generally n. 265 mi. to Elbe; at Prague, **2911.**
**Moldavia** (*mōl-dā'vĭ-ȧ*), dist. in Rumania between Pruth R. and Carpathian Mts.; 14,710 sq. mi.; pop. 2,140,000; **3080.**
**Molds,** fungous growths, **2235–6;** in cheese, **709.**
**Mole,** a small insect-eating mammal, **2278–9;** evolutionary position, *diagram,* **128;** foot, *picture,* **1572;** fur, **1390.**
**Mole cricket, 921;** foot and ear, *picture.* **1784.**
**Molec'ular theory of magnetism, 2122–3.**
**Molecules** (*mŏl'ē-kūlz*), smallest possible particles of a chemical compound, **714, 256;** aligned in magnets, **2122–3;** motions cause heat, **1618,** *pictures,* **1619;** move freely in gases, **1403.**
**Molière** (*mō-lyĕr'*) **(Jean-Baptiste Poquelin)** (1622–73), Fr. comic dramatist, **2279–80, 1364,** *picture,* **1363.**
**Moline',** Ill. Mfg. city in n.w. on Mississippi R. adjoining Rock Island and just across r. from Davenport, Iowa; pop. 30,734; numerous mills and factories; known especially for its mfrs. of farm implements; good water-power; coal fields near by.
**Molino del Rey** (*mō-lē'nō dĕl rā*) ("king's mill"), Mexico. Massive stone buildings 3 mi. w. of Mexico City; hotly fought battle in Mexican War (1847) resulting in Mexican defeat.
**Mollendo** (*mōl-yĕn'dō*), Peru, seaport and r.r. terminus, chief port for Bolivian commerce; pop. 4000; **2744.**
**Mol'lusks,** a group of soft-bodied animals, usually shelled, of a definite, primitive type, **2280–1, 127,** *Study Outline,* **3945;** appearance in geologic time, **1418;** cuttlefish, **941–2;** clams and mussels, **782–3;** nautilus, **2418,** octopus, **943;** oysters, **2612–6;** scallops, **3133–4;** shells, **3201;** snails and slugs, **3255–6;** squid, **942, 3333;** yield pearls, **2703.**
**Mollwitz** (*mōl'vĭts*), Germany. Village 25 mi. s.e. of Breslau; where Frederick the Great defeated Austrians under Marshal Neipperg (1741) in First Silesian War.
**Molly Maguires.** A secret organization founded 1845 in Ireland to resist rent collectors; also a similar organization in mining dists. of Pennsylvania, suppressed 1877 after execution of leaders for murders of mine officials.
**Moloch** (*mō'lŏk*) or **Molech,** Semitic fire-god, **2774, 3549.**
**Molokai** (*mō-lō-kä'ē*), one of the Hawaiian Isls.; 261 sq. mi.; pop. 1791; *map,* **1604;** leper settlement, **1603.**
**Molonglo River,** small stream of New South Wales, **628.**
**Molting,** of birds, **409–10, 411–2, 1228;** caterpillars, **660, 1964;** in ducks, **1044.**
**Moltke** (*mōlt'kē*), **Helmuth Johannes von** (1848–1916). Ger. general, nephew of following; chief of staff at outbreak of World War; superseded by Falkenhayn Dec. 1914.
**Moltke, Helmuth Karl, Count von** (1809–91), Prussian field marshal and chief of staff, greatest strategist of latter 19th cent.; reorganizer of Prussian army; planned campaigns against Austria (1866) and France (1870–71); a strong reserved man, "silent in 7 languages"; in Franco-Prussian War, **1356, 427.**
**Moluc'cas** or **Spice Islands,** group of Dutch isls. in Malay archipelago between New Guinea and Celebes; 144,120 sq. mi.; pop. 560,000; export spices, sago, coconuts; *map,* **1073;** cloves, **810;** discovered, **2116.**
**Mo'ly,** fabled flower with magic properties, **768.**
**Molybdenite** (*mŏ-lĭb'dē-nīt*), a soft, lead-gray sulphide of molybdenum; crystals as wireless detectors, **3761.**
**Molyb'denum,** a silvery, metallic element, **4042;** alloyed with steel, **99.**
**Mombasa** (*mŏm-bä'sä*), chief town and seaport of Brit. E. Africa on isl. connected by causeway with mainland; pop. 30,000; r.r. terminus; coaling station; **1068;** native quarters, *picture.* **39.**
**Momen'tum,** the power of a moving body to overcome resistance, **4029;** equals its mass multiplied by its velocity.

**Mommsen** (*mŏm'zĕn*), **Theodor** (1817–1903). Ger. classical scholar and historian, called by Freeman "well-nigh greatest scholar of all times"; his 'History of Rome', "one of most masterly histories ever written," though biased in favor of monarchy; Nobel prize winner for literature 1903.

**Momotom'bo,** active volcano of Nicaragua on n.w. shore of L. Managua (4250 ft.), **2505.**

**Momus** (*mō'mŭs*). In Gk. myth., god of censure and mockery who found fault with everything and burst with spite, unable to find flaws in Aphrodite.

**Monaco** (*mŏn'ä-kō*), **Albert Honoré Charles, Prince of** (1848–1922), ruler of the principality of Monaco and oceanographer; succeeded his father Charles III 1889; served in Span. and Fr. navies; made a number of voyages to investigate deep-sea life and sea currents; **2313.**

**Monaco,** the smallest state in Europe, on Mediterranean in s.e. France; 8 sq. mi.; pop. 23,000; **2313.**

**Monad'nock, Mt.,** in s.e. N.H. (3186 ft.), **2453,** *map,* **2454.**

**Mon'aghan.** Inland county in Ulster province, n. Ireland; 496 sq. mi.; pop. 71,000; county town Monaghan.

**'Mona Lisa'** (*mō'nä lē'zä*), Da Vinci's great portrait, also called 'La Gioconda', **3644,** *picture,* **1203.**

**Monarch butterfly,** color plate, **548–9.**

**Monarchy** (*mŏn'ăr-kĭ*), in anc. Greece, **1521, 1522;** Rome, **3046, 258.**

**Mon'astery.** *See in Index* **Monks and monasticism.**

**Monastir** (*mŏn-ăs-tēr'*), also **Bitolia,** or **Bitolj,** Jugo-Slavia, commercial town 85 mi. n.w. of Saloniki; pop. 49,000; fomerly important Turkish garrison; taken by Serbia 1912; **2097, 3177.**

**Mon'azite sand,** a brownish crystalline mineral containing phosphates of several rare elements; yields thorium and cerium, **2247.**

**Mönch** (*mûnĸ*) ("the monk"), a peak of the Bernese Alps (13,465 ft.), **3413,** *picture,* **102.**

**Monc'ton,** New Brunswick. City on Petitcodiac R., near Bay of Fundy; pop. 18,000; natural gas region; r.r. workshops; woolens, hats, etc.

**Monda'min,** in Longfellow's 'Song of Hiawatha', personification of Indian corn, **2059–60.**

**Monday,** 2d day of week; meaning of name, **969.**

**Mondovi** (*mŏn-dō'vē*), Italy. City 55 mi. w. of Genoa; scene of Napoleon's victory over Sardinians (1796).

**Mones'sen,** Pa. Industrial borough 21 mi. s. of Pittsburgh, on Monongahela R.; pop. 18,179; large steel and sheet and tin plate works, foundries, wire fence and wooden-box factories, brick works.

**Monet** (*mō-nā'*), **Claude** (born 1840), Fr. landscape painter; captures wonderful fleeting effects of light and air; **2633.**

**Moneta** (*mō-nē'tä*), a name for Juno, **1903.**

**Money, 2281–4;** a measure of wealth and capital, **1076, 1077;** banknotes, **2282, 328;** coins first used, **923, 3242;** counterfeiting, **906;** decimal coinage, **1882;** gold coins, **1481, 1482;** gold standard and bimetallism, **2281–2, 3605–6, 1611, 791, 2104;** inflation during Civil War, **781;** inflation during World War, **2282;** iron, of anc. Sparta, **3309;** minting coins, **2258–9;** paper money, **2282, 2284;** photographing forbidden in U.S., **906;** salt as, **3116;** "seignorage," **2282;** shells, **3202;** tea as, **3451, 228;** tobacco as, **3508;** U.S. money, history, **3605–6.** *See also in Index* **Coins and coinage; Paper money; Silver, free coinage of.**

**Money orders,** postal, **2894.**

**Mongibello** (*mŏn-jē-bĕl'ō*), Sicilian name for Mt. Etna, "mountain of fire," **1185.**

**Mongo'lia,** vast Chinese dependency of e. Asia; 1,370,000 sq. mi.; pop. 2,500,000; **2285, 228, 740,** *maps,* **740, 232–3;** brick tea, **3451;** elevation, *map,* **232–3;** Japanese influence, **1863;** population, **2286,** *map,* **232–3;** rainfall, *map,* **232–3;** sheep, **3198–9;** vegetation, *map,* **232–3.**

**Mongolian race, 2956, 1943, 3557;** origin of name, **2286;** physical characteristics, **742;** resemble N. Amer. Indians, **1765.**

**Mon'gols,** a nomadic people originating in cent. Asia, **2285–6, 3440;** conquer China, **2285, 745–6, 2134;** India, **1752, 2286;** Mesopotamia, **2200–1;** modern descendants, **1748, 2286, 3229, 3440, 3557, 3556;** Russia, **2285, 3089.**

**Mon'goose,** a weasel-like animal of India, **2286;** in Martinique, **2156.**

**Mon'ists,** school of philosophers, **2773.**

**'Monitor',** Civil War ironclad, **2428, 1174;** battle with *Merrimac,* **2286–7, 779.**

**Monitor lizard, 2037,** *picture,* **2038.**

**Monk** or **Monck, George** (1608–70). Duke of Albemarle; Eng. Cromwellian general, after Cromwell's death secured Stuart restoration without bloodshed through parliamentary action.

**Monkey, 2287–97;** allied to lemurs, **1986;** a primate mammal, **2132;** drives pigeons from woods, **2804;** evolutionary position, *diagram,* **128;** said to have elementary language, **3657;** story, 'Adventures of Howler the Monkey', **2293–7.**

**Monkey-bread tree,** or baobab, a huge tropical tree, **3532, 34.**

**Monkey's dinner bell,** explosive seed-pod of the sand-box tree, **3171,** *pictures,* **3172, 2830.**

**Monks and monasticism, 2298–2302, 763;** Buddhist, **541, 3227;** crusading orders, **932;** in England, **2608, 1636;** in Greece, **1528;** Jesuit order founded by Loyola, **2075;** libraries and books, **2300, 456,** *picture,* **2710;** Luther's attitude, **2987;** St. Francis founds Franciscans, **1355;** in Tibet, **3496.** *See also in Index* chief orders by name.

**Monk's-hood,** or wolf's-bane, a plant of the crowfoot family, with hooded flowers, yielding aconite, **2855,** *picture,* **2853.**

**Monmouth** (*mŏn'mŭth*), **James, Duke of** (1649–85), Eng. pretender to the throne, the "Protestant Duke," illegitimate son of Charles II; regarded as head of English Protestant party; captured in attempted rebellion against James II and beheaded, **1861.**

**Monmouth,** Ill. City in agricultural and coal-mining region, 90 mi. n.w. of Springfield; pop. 8,120; Monmouth College.

**Monmouth College.** At Monmouth, Ill.; opened 1856; arts and science, music, art; co-ed., United Presb.

**Monmouth Court House, battle of,** fought 1778 at Freehold, Monmouth County, N.J., 27 mi. e. of Trenton, **3004, 3707.**

**Mon'mouthshire.** Eng. county e. of s. Wales; 534 sq. mi.; pop. 461,000; iron works; part of Wales until 1535; county seat Monmouth.

**Monocacy** (*mō-nŏk'ă-sĭ*) **River,** rises in s. Pa.; crosses w. Md. to Potomac, **2902.**

**Monoceros** (*mō-nŏs'ēr-ŏs*) or **Unicorn,** a constellation; location, *charts,* **3343, 873.**

**Mon'ocle, 3310.**

**Monocotyle'dons,** plants with single-lobed seeds, **3173, 2831,** *Study Outline,* **3939–40.**

**Monoecious** (*mō-nē'shŭs*) **plants,** those having both, pistillate and staminate flowers, **1305.**

**Monog'amy,** a form of marriage, **1224.**

**Mono'mial,** in algebra, **95.**

**Mono'na, Lake,** Wis., **3770.**

**Monongahela** (*mō-nŏn-ga-hē'lä*) **River,** flows 125 mi. through W. Va. and Pa., **2573,** *picture,* **2813;** coal traffic, **2812.**

**Mon'oplane,** airplane with one supporting plane, **58,** *picture,* **57.**

**Monop'oly,** exclusive right to carry on a particular business; Ceylon pearl fisheries, **685;** medieval gilds, **1459;** patents, **2692, 2694;** spice trade, **3317;** public utilities, **2932–3;** trusts, **3545–6.**

**Mon'orail,** gyroscope system, **1555;** overhead, *picture,* **2081.**

**Mon'otheism,** belief in one God; in anc. Egypt, **1105;** Hebrew religion, **388, 2994;** in Mohammed's teachings, **2275.**

**Monotrem'ata,** the order of primitive egg-laying mammals, including duckbills, **3950.**

**Mon'otype, 2303–5.**

**Monroe', Harriet** (born 1860). Amer. author, b. Chicago; founder (1912) and editor of *Poetry,* a magazine of verse.

**Monroe, James** (1758–1831), 5th president of U.S., **2305–7;** negotiates Louisiana Purchase, **2306, 2073.** —*Administrations,* **2306–7;** Seminole War, **1856;** Brit.-Amer. joint occupation of Ore., **2597;** Fla. acquired (1819), **1295;** Missouri Compromise (1820), **2273;** Monroe Doctrine formulated, **2307–8, 2305, 448;** J. Q. Adams sec. of state, **15.**

**Monroe, Fort.** *See in Index* **Fort Monroe.**

**Monroe,** La. Port on Ouachita R., 97 mi. e. of Shreveport; pop. 12,675; in cotton-raising, farming, lumbering, and large natural gas dist.; cotton and lumber products.

**Monroe,** Mich. City 35 mi. s.w. of Detroit on Raisin R., 2 mi. from L. Erie; pop. 11,573; agricultural region; flour, lumber, paper, paint; nurseries and fisheries near by; battle of Frenchtown fought here (1813).

**Monroe Doctrine, 2307–8, 2305, 448;** effect on European colonization, **837;** in German-Venezuelan dispute, **2607, 3062, 3623;** involves U.S. in Haiti, **1560;** not affected by League of Nations covenant, **1974;** in Mexico, **2216, 3606;** in Santo Domingo, **3062, 3125;** in Venezuelan boundary dispute, **3622–3, 791.**

**Monrovia** (*mŏn-rō'vĭ-ä*), scaport and cap. of Liberia; pop. 6000; **1991.**

**Mons** (*mōns*), mining and mfg. city in s.w. Belgium 35 mi. s.w. of Brussels; pop. 27,000; battle (1914) in World War, **3810, 2386.**

**Monsoon',** a seasonal wind of Asia, **3751;** in anc. navigation, **1763;** effect in India, **1746–7;** in Philippines, **2765.**

**Montagu** (*mŏn'tä-gū*), **Lady Mary Wortley** (1689–1762). Eng. beauty, wit, letter-writer, and eccentric character; introduced inoculation against smallpox into England.

**Mon'tague,** in Shakespeare's 'Romeo and Juliet', Romeo's family, at feud with Capulets, **3058.**

**Montaigne** (*mŏn-tān'*), **Michel Eyquem de** (1533–92), Fr. essayist, **2308, 1177, 1364.**

**Montalembert** (*môn-tä-läṅ-bĕr'*), **Charles Forbes René de** (1810–70). Fr. publicist and historian; Rom. Cath. Liberal leader ('Life of St. Elizabeth of Hungary').

**Montana** (*mŏn-tă'nä*), state in n.w. U.S.; 147,182 sq. mi.; pop. 548,889; cap. Helena; **2308–12,** *maps,* **2309, 3584–5;** agriculture, **2310,** *picture,* **2901;** chief cities, **2312;** Glacier National Park **1466, 1465, 2308,** *picture,* **2402;** history, **2309, 2312;** meaning of name, **2308;** mineral wealth, **2309–10, 1410;** state flower, **3347;** surface features, **2308.**

**Montana State College of Agriculture and Mechanic Arts,** at Bozeman, Mont.; co-ed.; founded 1893; agriculture, engineering, applied science, etc.; **2312.**
**Montana State University,** at Missoula, Mont.; co-ed.; opened 1895; arts and science, forestry, journalism, law, etc.; **2312,** *picture,* **2311.**
**Montargis** (*môn-tär-zhē'*), France. Town 63 mi. s.e. of Paris; pop. 11,000; famous for "dog of Montargis," said to have revealed master's murderer by constantly following him; Mirabeau born at the Château de Bignon near by.
**'Montauk',** Federal monitor, *picture,* **777.**
**Mont Blanc.** *See in Index* **Blanc, Mont.**
**Montcalm', Marquis Louis Joseph de** (1712–59), Fr. general, **2312;** tomb, **2948.**
**Mont Cenis** (*môn sē-nē'*) **tunnel, 3552.**
**Montclair,** N.J. Residential town 7 mi. n. of Newark and 15 mi. n.w. of New York City; pop. 28,810; on first range of Orange Mts.
**Montebello** (*mŏn-tā-bĕl'lō*). Village in n. Italy 40 mi. n. of Genoa, where French defeated Austrians 1800 and 1859.
**Monte Carlo** (*mŏn'tĕ kär'lō*), town in principality of Monaco; pop. 10,000; noted for gambling; **2312-3.**
**Monte Cris'to.** Small barren Ital. isl. in Mediterranean, about 25 mi. s. of Elba; penal colony since 1874. *See in Index* **'Count of Monte Cristo'.**
**Montefiore** (*mŏn-tĕ-fī-ō'rē*), **Sir Moses** (1784–1885). Wealthy Jewish philanthropist in England; amassed fortune on London stock exchange and after his 43d year devoted all his time to improving condition of Jews in any part of world where they were oppressed, particularly Russia and Turkey.
**Montenegro** (*mŏn-tĕ-nē'grō*), small country in n.w. Balkan peninsula, now part of Jugo-Slavia; 3536 sq. mi.; pop. 239,000; **2313, 3250, 1901,** *map,* **308;** in Balkan wars, **310;** in World War, **3795, 3807.**
**Montenotte** (*mōn-tā-nōt'tā*). Village 25 mi. w. of Genoa, Italy, where Napoleon won first victory (1796), defeating Austrians.
**Montereau** (*môn'rō'*), France. Town on Seine R. 45 mi. s.e. of Paris, near which Napoleon defeated Allies in 1814.
**Monterey** (*mŏn-tĕ-rā'*), Calif., resort on Monterey Bay, about 100 mi. s.e. of San Francisco; pop. 5479; fishing and canning interests; picturesque old Span. buildings; first cap. of Calif.; **580;** harbor, **582.**
**Monterey,** r.r. and mfg. center in n.e. Mexico, cap. of Nuevo Leon state; pop. 74,000; captured by Gen. Taylor, **2207–8;** manufactures, **2212.**
**Montesquieu** (*môn-tĕs-kyû'*), **Charles Louis de Secondat, Baron de** (1689–1755), Fr. political philosopher, called founder of science of comparative politics and philosophy of history ('Esprit des lois'—"Spirit of the Laws"); influence on Fr. Rev., **1367.**
**Montessori** (*mōn-tĕs-sō'rē*), **Maria** (born 1870), Ital. educator and psychiatrist, inventor of the "Montessori system" of teaching, **2313, 2314.**
**Montessori method, 2313–6.**
**Montevid'eo,** cap. of Uruguay; pop. 362,000; **2316;** climate, **3608;** Plata R., **2831.**
**Montezu'ma II** (1466–1520), last Aztec chief or "emperor" of Mexico, **228, 289, 290, 894, 895.**
**Montfaucon** (*môn-fō-kôn'*). Hill 13 mi. n.w. of Verdun, key to Ger. first line in Meuse-Argonne; captured by Americans Sept. 27, 1918, 2d day of battle.
**Mont'fort, Simon de** (1200?–65), Earl of Leicester, Eng. statesman and soldier, **2316–7;** calls first Parliament, **2687;** and Edward I, **1087;** leader in Barons' Wars, **1634.**
**Montgolfier** (*môn-gŏl-fyā'*), **Jacques Etienne** (1745–99) and **Joseph Michel** (1740–1810), brothers, Fr. inventors of balloon, **310, 312,** *pictures,* **311, 313.**
**Montgom'ery, James** (1771–1854). Brit. poet; of his 'Wanderer in Switzerland', Byron said it was worth a thousand 'Lyrical Ballads'; humanitarian sentiments inspired his verse; more than 100 hymns by him still in use.
**Montgomery, Lucy Maud** (Mrs. Ewan Macdonald) (born 1874), Canadian novelist, b. Prince Edward Isl., **624.**
**Montgomery, Richard** (1736–75). Amer. soldier, b. Ireland; appointed brig.-gen. in Continental army 1775, and with Benedict Arnold led futile attack on Quebec Dec. 31, 1775; killed almost at first shot.
**Montgomery,** Ala., state cap.; pop. 43,464; near center of state on Alabama R.; mfg. and r.r. center and important inland cotton market; ships grain, fruit, and vegetables; capitol, *picture,* **71;** first seat of Confederacy, **857, 73.**
**Montgomeryshire.** Inland county in cent. Wales; 797 sq. mi.; pop. 53,000; county town Montgomery; climate mild and soil fertile, especially in Severn valley; here English is almost unknown language.
**Month,** in calendar, **2317.**
**Montholon** (*môn-tō-lôn'*), **Charles Tristan, Marquis de** (1782–1853). Fr. soldier, devoted to Napoleon, whom he accompanied to exile at St. Helena; to him Napoleon dictated notes on his career.
**Monti** (*mōn'tē*), **Vincenzo** (1754–1828), Ital. poet and dramatist; chief works, **1833.**
**Monticel'lo,** Va., Jefferson's home, **1883, 3650.**
**Montmartre** (*môn-mär'tr*), a hill in Paris, **2684.**
**Montmoren'cy, Falls of,** Canada. Beautiful cascade over 250 ft. high in Montmorency R. at confluence with St. Lawrence near Quebec.
**Montpe'lier,** Vt., cap.; pop. 7125; on Winooski R., in agricultural region; granite, flour, lumber, woodworking machinery, and clothes pins; **3633;** capitol, *picture,* **3631.**
**Montpelier,** Va., Madison's estate, **2106, 2108.**
**Montpellier** (*môn-pĕ-lyā'*). City in s. France 6 mi. from Mediterranean; pop. 80,000; noted univ.; large trade in wine, fruit, and silk; makes soap, candles, leather, distilled liquors.
**Montreal** (*mŏn-trē-äl'*), Quebec, largest city of Canada; pop. 800,000; **2317, 2946,** *picture,* **609;** great bell, **379;** Cartier, **652;** St. Lawrence R., **3107, 3108.**
**Montreal, University of.** At Montreal, Quebec; Cath.; men; established 1876 as branch of Laval Univ., Quebec; practically independent after 1889, and reorganized under present name 1919; arts, law, medicine, theology, social, political, and applied sciences.
**Montrose', James Graham, Marquis of** (1612–50). Scotch Jacobite general; signed Covenant of 1637 but believed in subordination of church to state; joined Royalists 1640, and won many victories against Covenanters; except Cromwell greatest soldier of Civil War; betrayed, imprisoned, hanged as a traitor by order of Scotch parliament; wrote many poems (celebrated lyric, 'My Dear and Only Love').
**Montrose, James, Duke of** (d. 1742), Scotch leader, favored union of Scotland and England; regent of kingdom on death of Queen Anne; and Rob Roy, **3033.**
**Monts** (*môn*), **Pierre du Guast, Sieur de** (1560–1611). Fr. courtier, founder of Acadia; sent out expedition under Champlain which founded Quebec.
**Mont Saint-Michel** (*môn săn mē-shĕl'*) ("St. Michael's Mount"), rocky isl. of w. France a mile off coast of Normandy; famous for fortress-abbey, one of the noblest examples of medieval Gothic architecture; *picture,* **1342.**
**Montsec** (*môn-sĕk'*), an isolated height 8 mi. e. of St. Mihiel and overlooking southern face of St. Mihiel salient; captured by Americans Sept. 12, 1918, in St. Mihiel offensive; location, *picture,* **3803.**
**Montserrat** (*mŏnt-sĕ-răt'*). In Brit. W. Indies, one of Leeward Isls.; 32 sq. mi.; pop. about 13,000, mostly negroes; Soufrière, an active volcano.
**Montserrat.** Jagged mt. 30 mi. n.w. of Barcelona, Spain; vast fissure, dividing it into two, said to have occurred at time of Crucifixion; famous monastery, in medieval legend the castle of the Holy Grail, now houses celebrated image of Virgin, visited by thousands of pilgrims yearly.
**Montt** (*mōnt*), **Manuel** (1809–80). Chilean statesman, president during "decade of Montt," 1851–61, which by establishment of modern communications, schools, and banks, laid foundation for subsequent Chilean prosperity; pres. of Supreme Court 1861–80.
**Monulph, Saint** (6th cent.), bishop of Tongres; founds Liége, **1995.**
**"Monuments, the,"** in Ariz., *picture,* **203.**
**Mood** or **mode,** of verb, **3627.**
**Moodie, Mrs. Susanna** (1803–85), Canadian author; contributed to periodicals and wrote poems and novels of Canadian life; **623.**
**Moody, Dwight Lyman** (1837–99), Amer. evangelist, **2317.**
**Moody, William Vaughan** (1869–1910), Amer. poet and playwright, b. Spencer, Ind.; chief plays, **1038.**
**Moody Bible Institute, 2317.**
**Moon, 2318–23;** eclipses, **1074;** and gravity, **1506, 1508, 2322,** *picture,* **2320;** lunar month, **2317;** in myth., **1626, 221;** theories of origin and age, **1060, 2819;** tides, **3497, 2323.**
**Moon, Mountains of the,** name given in anc. geography to African range identified in part with Ruwenzori Mts., **36, 2510.**
**Mooney, William** (d. 1832), organized Tammany Society, **3432.**
**Moonstone, 1230, 1409.**
**Moor,** waste land, either dry or swampy; vegetation of swampy type, **3700.**
**Moore George** (born 1853), Irish novelist and dramatist, whose highly individualistic work is appreciated by only a limited public; most popular books the autobiographical trilogy 'Ave', 'Salve', and 'Vale'; **2541, 1167.**
**Moore, Sir John** (1761–1809). Brit. general, commander in Spain against Napoleon at Corunna; killed in moment of victory; buried in ramparts, as described in Wolfe's poem 'The Burial of Sir John Moore'.
**Moore, Thomas** (1779–1852), Irish poet ('Lalla Rookh', 'Irish Melodies', and 'National Airs', containing many still familiar songs like 'The Last Rose of Summer'), **1814.**
**Moorfowl,** the Brit. grouse, **1545.**
**Moors,** mixed Berber-Arabian race of n. Africa, **2323;** architecture, *picture,* **3298;** civilization, **2278;** invade Gaul, **1343, 2278;** in Morocco, **2328;** in Spain, **3303–4, 3302, 1491;** Ximenes attempts to convert, **3824.**

**"Moors,"** or "White Indians," in Del., **989.**
**Moose,** the Amer. elk, **2325,** *picture,* **2324.**
**Moose elm, 1138–9.**
**Moosehead Lake,** Me., irregular lake near center of state; 35 mi. long; 115 sq. mi.; outlet, Kennebec R.; **2128.**
**Moose Jaw,** Saskatchewan, industrial, r.r., and grain distributing center 40 mi. w. of Regina; pop. 20,000; flour, lumber, packing-house products; govt. stock yards; **3128.**
**Mop'lah.** Fanatical Mohammedan sect of Malabar dist., India, numbering upwards of a million; believed to be descended from Arab immigrants; revolted 1921–22, killing hundreds of British and Hindus.
**Mora'ceae,** the mulberry family of plants, including mulberries, hemp, figs, and breadfruits, **3940.**
**Moraine** (*mō-rān'*), a rock belt formed by a glacier, **1466.**
**Moral'ities,** or morality plays, allegorical plays of Middle Ages, **2259, 1033–4.**
**Moral problems, 1180.**
**Moran** (*mō-rān'*), **Thomas** (born 1857). Amer. etcher, illustrator, and landscape painter ('Grand Cañon of the Yellowstone').
**Morat** (*mō-rät'*), town in w. Switzerland 15 mi. w. of Bern; battle (1476), **697.**
**Moratin** (*mō-rä-tēn'*), **Leandro Fernandez de** (1760–1828), Span. dramatist and poet, **3307.**
**Mora'via,** province of Czecho-Slovakia, formerly Austrian crownland; 8584 sq. mi.; pop. 2,600,000; **948,** *maps,* **947, 271;** racial character of people, **3250.**
**Moravians** or **United Brethren,** Christian sect which arose in Bohemia and Moravia among followers of John Huss; noted for missionary work; Wesley influenced by, **3718.**
**Moray** (*mŏr'ā*), **Earl of.** *See in Index* **Murray, James Stuart, Earl of.**
**Moray Firth,** large bay on n.e. coast of Scotland, **3146.**
**Mor'dant,** an acid or "biting" substance, particularly one used to fix dye, **104;** gum tragacanth, **1552.**
**Mordecai** (*môr'dĕ-kī*), cousin of Esther, **1179–80.**
**More, Hannah** (1745–1833). Eng. writer of verse and of plays and books on moral and religious subjects; later years devoted to philanthropy and encouragement of popular education ('Coelebs in Search of a Wife').
**More, Sir Thomas** (1478–1535), Eng. statesman, scholar, and author, **2325–6, 1164;** friendship with Erasmus, **2996;** and Holbein, *picture,* **1672.**
**Morea** (*mō-rē'ä*), modern name for s. Greece, anc. Peloponnesus, **1517.**
**Moreau** (*mō-rō'*), **Jean Victor Marie** (1763–1813). Fr. Rev. general; victor of Hohenlinden 1800; exiled for alleged conspiracy against Napoleon; joined Allies against Napoleon 1813; killed on battlefield of Dresden.
**Moreau River,** S.D., tributary of the Missouri, 200 mi. long, *map,* **3296.**
**Morel',** an edible fungus, **2375,** *picture,* **2374–5.**
**Morelia** (*mō-rā'lyä*), Mexico, formerly Valladolid. City 130 mi. n.w. of Mexico City named for patriot Morelos; pop. 40,000; college of San Nicholas de Hidalgo; textiles, sugar, sweetmeats.
**Morelos** (*mō-rā'lōs*), Mexico. State in s.-center; 1895 sq. mi.; pop. 184,000; cap. Guernavaca.
**"More sinned against than sinning," 1926.**
**Morgan, Sir Henry** (1635?–88). Brit. buccaneer; captured and plundered Panama 1671; was knighted and made lieut.-gov. of Jamaica.
**Morgan, John Hunt** (1836–64), Amer. Confederate general, daring and famous cavalry raider; raids Ind. and Ohio, **781.**
**Morgan, John Pierpont** (1837–1913). Amer. banker, financier, and art collector; leader in movement by which industry was stabilized and subordinated to finance; made J. P. Morgan & Co. one of world's most powerful banking houses, organized U.S. Steel Co., controlled many railroads.
**Morgan, John Pierpont** (born 1867). Son of the preceding, succeeded to control of his father's banking business; during World War he was Brit. government's commercial agent in U.S.
**Morgan, John Tyler** (1824–1907). U.S. senator from Ala. from 1877 to his death, enlisted 1861 in Confederate army, brig.-gen. 1863; member of board 1892 to arbitrate Bering fisheries dispute and of commission 1898 to codify Hawaiian laws.
**Morgan, Lewis H.** (1818–81). Amer. archeologist and ethnologist ('League of the Iroquois'; 'Ancient Society'); bequeathed fund to found woman's college in U. of Rochester.
**Morgan, William** (1775–1826?), Amer. filibuster, **2802.**
**Morganat'ic marriage.** Marriage of a member of a royal family to a woman of lesser rank; not unusual in European court circles; neither wife nor children receive royal rank and title.
**Morgantown,** W. Va., industrial city near n. boundary, on Monongahela R.; pop. 12,127; coal, oil, glass-sand, and limestone near by; sheet and tin plate, glass, brick, etc.; univ., **3723,** *picture,* **3721.**
**Morgarten** (*mōr-gär'tĕn*). Hill in n. Switzerland, 18 mi. s. of Zurich, where Swiss mountaineers defeated Austrian army 1315; first Swiss victory in struggle for freedom.
**Mor'genthau, Henry** (born 1856), Amer. diplomat, b. Germany; ambassador to Turkey 1913–16; in charge of interests of Allies in Turkey during World War 1914–16; nominated ambassador to Mexico in 1920, but did not go on account of revolution; **1892.**
**Morghen** (*môr'gĕn*), **Raffaello** (1758–1833). Ital. engraver; copied paintings by Leonardo da Vinci, Raphael, and other masters.
**Moris'cos** ("little Moors"), Mohammedans in Spain who accepted baptism, and their descendants, **2323, 2763.**
**Morland, George** (1763–1804). Eng. painter of animals and rustic scenes; many of his best paintings are familiar through engraved copies.
**Morley, Margaret Warner** (born 1858). Amer. author, b. Montrose, Iowa; she wrote 'A Song of Life', 'The Bee People', 'Wasps and their Ways', and other books which present biology for children.
**Morley of Blackburn, John Morley, Viscount** (born 1838). Eng. statesman and man of letters, for 25 years a conspicuous Liberal in House of Commons; secretary for Ireland under Gladstone and for India under Campbell-Bannerman and Asquith; wrote lives of Gladstone, Burke, Cobden, Voltaire, Rousseau, his own 'Recollections'.
**Mor'mons** or **Latter-Day Saints, 2326–7;** in Ariz., **202;** Edmunds Act, **223;** in Idaho, **1727;** irrigation works, **3610;** "Mormon War" in Mo., **2273;** in Nev., **2446;** in Utah, **3610, 3612, 3116, 3118;** in Wyo., **3822.**
**"Mormon War,"** in Mo. (1838), **2273.**
**Morning-glory,** a flowering vine with bell-like flowers, **2327,** *picture,* **2408;** related to sweet potato, **3405.**
**Morningside College.** At Sioux City, Iowa; co-ed.; Meth.; founded 1894; arts and science.
**"Morning star of song," 702.**
**Morocco,** sultanate in n.w. Africa, mostly Fr. protectorate; 231,500 sq. mi.; pop. 6,000,000; **2327–8,** *maps,* **97, 40–1;** Moors, **2323;** piracy, **971.**
**Morocco** or **Marakesh.** One of caps. of Morocco, in w.; estimated pop. 105,000; morocco leather mfrs.; founded 1072 and reached greatest prosperity about 1300, when pop. is said to have been 700,000.
**Morocco leather, 1977, 2328;** Egyptian, **1097.**
**Moros,** Malay race in Philippines, **2766;** subdued by Pershing, **2733.**
**Morot** (*mō-rō'*), **Aimé Nicolas** (1850–1913), Fr. historical and portrait painter; protraits of members of fashionable and artistic world of Paris, battle scenes, etc.; picture by, **1352.**
**Morpheus** (*môr'fūs*). In Rom. myth., dream god, son of Somnus (sleep).
**Morphine,** the principal alkaloid of opium, **2585;** chemical properties, **10;** treatment for morphine poisoning, **2855;** used in "twilight sleep," **125.**
**Morphol'ogy,** science dealing with form and structure of living organisms, **121;** of animals, **3841;** of plants, **473, 475.**
**Mor'rill, Justin Smith** (1810–98). Amer. legislator, representative from Vt. 1854–67, senator 1867 to his death; author of Morrill Act.
**Morrill Act** (1862), **830.**
**Morris, Charles** (1784–1856). Amer. naval officer who commanded the *Constitution* in battle with *Guerrière;* 1819 commander of S. Amer. squadron; later superintendent of Naval Academy.
**Morris, Clara** (born 1849). Amer. emotional actress (Camille, Alixe, Lady Macbeth); after retiring from stage wrote about stage life; several novels and stories.
**Morris, Gouverneur** (1752–1816), Amer. statesman, aristocrat by training and temperament, but ardent supporter of Rev. because he believed in its justice; as assistant to Robert Morris 1781–85 proposed decimal system of coinage and words *dollar* and *cent;* much of later life spent abroad, two years as ambassador to France; chairman of board 1810–16 which planned Erie Canal.
**Morris, Robert** (1734–1806), financier of the Amer. Rev., **2328–9;** charters brig *Nancy,* **3743.**
**Morris, William** (1834–96), Eng. poet, artist, and social reformer, **2329;** influence on furniture-making, **1384;** Trinity Church, **471.**
**Morrison, Robert** (1782–1834). Eng. missionary, first Protestant missionary in China (1807); translated New Testament into Chinese, and compiled monumental 'Chinese Dictionary'.
**Morrison, Mt.,** in Formosa, **1332.**
**Morristown,** N.J., residential town 17 mi. n.w. of Newark in rich farming dist.; pop. 12,548; State Insane Hospital 4 mi. away; shaft for first steamship to cross Atlantic was cast here, and Morse and Vail worked on electric telegraph; Washington's winter quarters, **3003.**
**Mor'ro Castle,** Havana, **1600.**
**Morro Velho,** Brazil, world's deepest gold mine, **1479,** *picture,* **51.**
**Morse, Samuel Finley Breese** (1791–1872), Amer. artist and inventor of the electric telegraph, **2329–30, 3454, 3456,** *picture,* **2331;** helped by Fillmore, **1240.**

**Morse code** in telegraphy, **3456, 2330**; used in wigwag signaling, **3233.**
**Mortal'ity,** decreasing rate, **2880–1**; "law of," **1792.**
**Mor'tar,** short cannon firing at high angles, **633.**
**Mortara** (*môr-tä'rä*). Town in n. Italy 25 mi. s.w. of Milan; pop. 9000; makes cheese and hats; Austrians defeated Sardinians 1849.
**Morte d' Arthur,** greatest collection of Arthurian romances, first printed by Caxton in 1485; **223, 1391.**
**Mortgage** (*môr'gāj*), security for bonds, **3359,** for bank loans, **327**; Serbian law, **3177.**
**Mortgarten, battle of** (1315), **3415.**
**Mortimer, Roger de** (1287–1330), first earl of March; an adherent of Edward II; later his enemy, **1088.**
**Mortimer's Cross.** Battle in Wars of Roses 1461, in w. England, 40 mi. s.w. of Birmingham; Edward, Duke of York, defeated Lancastrians.
**Morton, J. Sterling** (1832–1902), Amer. journalist and politician; sec. of agriculture 1893–97; originated Arbor Day, **173.**
**Morton, Levi Parsons** (1824–1920), Amer. banker, b. Shoreham, Vt.; minister to Francc 1881–85; vice-president of U.S. 1889–93; gov. of N.Y. 1895–97; **1592, 3636.**
**Morton, Oliver Perry** (1823–77), Amer. statesman, b. Salisbury, Ind.; gov. of Ind. 1861–67, and perhaps greatest of all war governors; U.S. senator 1867–77; **1762.**
**Morton, Thomas** (1590?–1646). Eng. adventurer, a Royalist rake who amused himself at expense of the "precise Separatists that lived at New Plymouth"; set up a Maypole, and sold rum and guns to the Indians at Merry Mount, now Quincy, Mass.
**Morton, William T. G.** (1819–68), Amer. dentist and inventor, one of the first (1846) to use ether as surgical anesthetic; spent later part of his life in literary and legal contests over his claim to discovery; **124.**
**Mosaic** (*mō-zā'ĭk*), **2330,** *picture,* **2630**; in St. Mark's, **1851–2.**
**Mosaic law, 2333, 2918.**
**Mosby** (*mōz'bĭ*), **John Singleton** (1833–1916). Confederate soldier, guerrilla raider, and commander of independent cavalry body called Mosby's Rangers; particularly active in Va. and Md. 1863–64; said to have originated phrase "the solid South."
**Moscheles** (*mōsh'ĕ-lĕs*), **Felix** (1833–1918). Eng. portrait painter (Grover Cleveland, Browning, Gounod, Henry M. Stanley, and other famous men); intimate friend of Whistler, Du Maurier, and literary and artistic men of his time; son of Ignaz Moscheles.
**Moscheles, Ignaz** (1794–1870), Austrian pianist and composer; teacher and friend of Mendelssohn, **2198.**
**Moschus** (*mŏs'kŭs*) (2d cent. B.C.), Gk. pastoral poet ('Europa', a short epic), **1538.**
**Moscow** (*mŏs'kō*), Idaho. Town 65 mi. s.e. of Spokane, Wash.; pop. 4000; U. of Idaho.
**Moscow,** 2d city of Russia; pop. (before revolution), 2,000,000; **2330, 2332–3**; climate, **3086**; "czar" bell, *picture,* **379**; grand dukes of, **1853**; great fire, **1262**; Kremlin, *pictures,* **3093, 3095**; occupied by Napoleon, **2396,** *picture,* **2394.**
**Moselle** (*mō-zĕl'*), r. in n.e. France and s. Germany; flows 320 mi. n.e. to Rhine at Coblenz; valley noted for vineyards; **1439, 3005, 1346.**
**Moses,** leader and lawgiver of the Hebrews, **2333, 1890,** *pictures,* **1889, 2222.**
**Moses ben Mai'mon** or **Maimon'ides** (1135–1204), Jewish philosopher, **1625.**
**Mos'lems.** Name applied to themselves by the followers of Mohammed. *See in Index* **Mohammedanism.**
**Mosques** (*mŏsks*), Azhar, at Cairo, *picture,* **569**; Great Mosque at Mecca, **2187,** *picture,* **2186**; Santa Sophia, *pictures,* **2276, 182, 183**; of Shah Jehan, Delhi, *picture,* **990.**
**Mosquito** (*mŏs-kē'tō*), **2334–8**; eggs, **1091,** *picture,* **1091**; Panama Canal, **2651–4, 1490**; preyed upon by newts, **3113,** by birds, **3398.**
**Mosquito coast** or **Mosquitia,** strip of land occupicd by Mosquito Indians on e. coast of Cent. Amer.; long source of diplomatic disputes between Gt. Brit. and U.S.; now part of Nicaragua; **680.**
**Moss,** a flowerless plant, **2338–40**; club, **1234**; classed among plants, **2822, 3938**; Iceland moss a lichen, **1994**; "Irish moss" an edible seaweed, **3171,** *picture,* **3170**; reindeer moss a lichen, **1994**; sphagnum (bog moss), **2704–5, 3700**; Spanish (a flowering plant), **69, 2068, 2070,** *picture,* **1299.**
**Moss agate,** or mocha stone, **2945.**
**Moss animals,** the *Bryozoa,* **3814.**
**Moss** or **rose locust,** one of Amer. species of locust tree, **2045.**
**Moss pink,** a phlox, **2773.**
**Mostar** (*mŏs-tär'*), Jugo-Slavia. City 46 mi. s.w. of Serajevo; pop. 16,000 (Turco-Ital.); former cap. Herzegovina; fine Rom. bridge.
**Mosul** (*mō-sŭl'*), city in Mesopotamia on Tigris R. 220 mi. n. of Bagdad; pop. 80,000; caravan trade, **3499**; ruins of Nineveh, **2510.**
**Moszkowski** (*mŏsh-kŏv'skĭ*), **Moritz** (born 1854), Polish composer and pianist; chief works, **2381.**
**Motacil'lidae,** bird family of wagtails and pipits, **412, 3505.**
**Moth,** a scaly-winged insect whose antennae are not knobbed, **544–8, 1788**; army-worm a larval moth, **218–9**; cankerworm, **630**; caterpillars of moths, **660–2**; cloth-eating types, **661, 548**; cocoons, **1786**; codlin, **820**; cutworm larva of owlet moth, **944**; distinguished from butterflies, **546**; eye, *picture,* **1215**; gypsy, **548**; hornet, **1790–1,** *pictures,* **1790**; lappet, *picture,* **1785**; length of life, **126**; silkworm, **3240,** *picture,* **3234**; tussock, **548**; willow beauty, *picture,* **1785.**
**Moth balls,** made of naphthalene, **814.**
**Mother Carey's chickens, 2747.**
**Mother Goose, 2340.**
**"Mother Gunga"** or **Ganges River, 1393.**
**"Mother of Civilization," 226.**
**"Mother of Parliaments," 2687.**
**Mother-of-pearl,** or nacre, **3201, 2703**; obtained from abalone, **3202.**
**"Mother of Presidents," 3650.**
**Mother of the Gods, the Great.** *See in Index* **Cybele.**
**Mother of vinegar, 3644.**
**Mothers' pensions, 2722.**
**Motion, laws of, 2190.**
**Motion, perpetual, 1148.**
**Motion pictures, 2341–56**; as drama, **1039**; educational value, **2342, 2344**; how "trick" pictures are made, **2346, 2348,** *pictures,* **2349, 2350, 2351**; Los Angeles, center, **2063, 578,** *pictures,* **2062, 579**; photography, **2777–84**; preparation of the film, *pictures,* **2354–6**; projection apparatus, **3353–4,** *picture,* **2353.**
**Motley, John Lothrop** (1814–77), Amer. historian and diplomat, **114.**
**Motor,** a machine supplying mechanical power; airplane, **58, 60**; automobile, **280–2**; electric, **1124–5**; gas and gasoline engines, **1403–6, 2357**; Gnôme, **58,** *picture,* **65**; Liberty, **60**; solar, **3392, 3394**; turbines, **3553–4**; water types, **3695, 3554**; wind, **3749.** *See also in Index* **Steam engine.**
**Motor boats, 2357, 445**; gas engine, **1403–6, 2357.**
**Motorcycles, 391**; gas engine, **1403–6**; in World War, **274.**
**Motor nerves, 2437, 490.**
**Motor vehicles.** *See in Index* **Automobile.**
**Mott, Lucretia** (1793–1880), Amer. Quaker reformer, abolitionist, and women's rights advocate, b. Nantucket, Mass.; **3778.**
**Mouflon** (*mo͞of'lŏn*), a wild sheep, **3198.**
**Moukden.** Same as **Mukden.**
**Moultrie** (*mōl'trĭ*), **William** (1731–1805), Amer. Rev. general, b. Charleston, S.C.; builder of Ft. Moultrie, **699.**
**Mound-builders,** prehistoric Amer. Indians, **2357, 1767–8**; in Ill., **1731, 2357**; Wis.; **3772, 2357.**
**Moundsville,** W. Va. Commercial city 11 mi. s. of Wheeling, with farming and coal interests; pop. 10,669; lumber products, glass, enameled ware, bricks, lamps; zinc smelter; U.S. air station; state penitentiary; named from relics of mound-builders discovered there.
**Mounet-Sully** (*mo͞o-nā'-sü-lē'*), **Jean** (1841–1916). Fr. actor; commanding presence and passionate vigor of his acting were strikingly suited to variety of tragic and romantic parts (Oedipus, Hamlet, Hernani, Ruy Blas).
**Mount.** *See under* specific names, as **McKinley, Mount.**
**"Mountain,"** Fr. party, **1370, 3027.**
**Mountain ash, 2357**; classified, **3533.**
**Mountain elder, 1107.**
**Mountain goats,** or goat-antelopes, animals intermediate betwecn goats and antelopes; include Rocky Mt. goat, **146.** Term often applied to any wild goat, such as ibex, living in mountains.
**Mountain laurel, 1970.**
**Mountain lion,** cougar, or puma, **2933–4**; belongs to cat family, **658.**
**Mountains, 2357–8, 2788, 2790**; avalanche, **288**; affect climate, **795, 2358, 2973**; effect on spread of civilization, **2790, 1192–3, 1517, 3302, 3581, 1917–8**; measuring height, **332–3**; "old" and "young," *pictures,* **2789**; origin, **2790–1, 3657**; submarine, Atlantic, **254**; traces of marine life, **1334.** *See also in Index* under continents, countries, and names of chief mountains and mountain systems.

WORLD'S HIGHEST MOUNTAINS

| | HEIGHT IN FEET |
|---|---|
| Aconcagua, Argentina (*highest in South America*) | 22,860 |
| Mont Blanc, France, (*highest in Alps*) | 15,781 |
| Elbruz, Russia, (*highest in Europe*) | 18,470 |
| Etna, Sicily | 10,750 |
| Everest, Nepal, (*highest in world*) | 29,002 |
| Fujiyama, Japan | 12,365 |
| Godwin-Austen, India (*2d highest in world.*) | 28,265 |
| Kilimanjaro, Africa, (*highest in Africa*) | 19,780 |
| Kosciusko, Australia, (*highest in Australia*) | 7,336 |
| Logan, Canada, (*highest in Canada*) | 19,539 |
| McKinley, Alaska, (*highest in North America*) | 20,464 |
| Mauna Loa, Hawaiian Islands. | 13,675 |
| Mitchell, N. C. (*highest in eastern U.S.*) | 6,711 |
| Orizaba, Mexico, (*highest in Mexico*) | 18,250 |
| Washington, N. H. (*highest in northeastern U.S.*) | 6,293 |
| Whitney, Calif. (*highest in continental U.S.*) | 14,502 |

**Mountains of the Moon,** Africa, **36, 2510.**
**Mountain sumach, 3391.**
**Mountain time, 3500,** *chart,* **3501.**
**Mountain zebra, 3838.**
**Mount Allison University.** At Sackville, New Brunswick; co-ed.; Meth. in origin but now non-sectarian;

founded 1862 (academy 1842); arts and science, music, theology, engineering; affiliated with McGill.
**Mount Auburn Cemetery,** Watertown, Mass., **472.**
**Mount Carmel,** Pa. Borough in anthracite coal-mining region, 45 mi. n.e. of Harrisburg; pop. 17,469; mining implements, men's clothing, cigars, silk and knitted goods.
**Mount Desert Island,** off coast of Me.; 100 sq. mi.; **2128,** *map,* **2126.**
**Mount Holyoke College,** at South Hadley, Mass.; women; non-sectarian; chartered 1836 (opened 1837) as seminary, college since 1888; collegiate work, education, biblical history and literature, music, and art; **2170.**
**Mount McKinley Park,** Alaska, **2400.**
**Mount Pleasant,** Iowa. City 65 mi. s.w. of Davenport in agricultural and stock-raising section; pop. 3987; Iowa Wesleyan Univ.; state insane asylum.
**Mount Rainier** (*rā'nēr*) **National Park,** Wash., in Cascade Mts., 50 mi. s.e. of Seattle, **3687, 2400;** glacier, *picture,* **1465.**
**Mount Royal,** on isl. of Montreal; 900 ft. high; **2317.**
**Mount Saint Mary's College.** At Emmitsburg, Md.; men; Cath.; founded 1808; classics and science.
**Mountstephen, George Stephen, Baron** (1829–1921). Canadian financier, with Lord Strathcona responsible for completion of the Canadian Pacific R.R.
**Mount Union College.** Co-ed. institution at Alliance, Ohio; founded 1846; college of liberal arts, conservatory of music.
**Mount Vernon,** Iowa. Town 15 mi. s.e. of Cedar Rapids; pop. 1466; Cornell College.
**Mount Vernon,** N.Y. Residential and mfg. suburb near New York City on Bronx R. and several railroads; pop. 42,726; makes optical supplies, electric machinery.
**Mount Vernon,** Va., George Washington's home, **2358–9, 3676;** origin of name, **3674;** Washington buried, **3680.**
**Mount Wilson Observatory,** Pasadena, Calif., **2552, 3463.**
**Mourning cloak butterfly,** color plate facing **548.**
**Mourning** or **turtle dove, 2803,** *pictures,* **415, 2411;** consumes weed seeds, **402.**
**Mouse,** a rodent, **2359–62;** foot, *picture,* **1323;** gnawing teeth, **3036;** length of life, **126;** story, 'How the Mouse Grew So Small', **2360–2;** white-footed, called dormouse, **1027,** *picture,* **2409.**
**Mouse** or **Souris River,** in Canada and North Dakota, 500 mi. to the Assiniboine R., *maps,* **2524, 602–3.**
**Mouse weasel, 3707.**
**Mouth,** entrance to alimentary canal of animals; of bee, *picture,* **359;** birds, **400;** fish, **1274;** insects, **1782, 1787;** mollusks, **2280;** octopus, **943;** rodents, **3036;** sharks, **3196–7;** snake, **3259;** spider, *picture,* **3323;** starfish, **3345;** teeth, **3452–4;** tongue structures, **3513.**
**Mo'wat, Sir Oliver** (1820–1903). Canadian statesman, leader in movement for Confederation; premier of Ontario 1872–96; lieut.-gov. of Ontario after 1897; a Liberal leader who was a strong supporter of provincial rights as against the Dominion Parliament.
**Mowgli** (*mow'glē*), **story of,** retold from Kipling, **1927–9.**
**Mozambique** (*mō-zam-bēk'*) or **Portuguese East Africa,** a colony of Portugal on e. coast of Africa; 428,132 sq. mi.; pop. 3,120,000; **1069–70,** *maps,* **1069, 40–1, 3282.**
**Mozart** (*mō'tsärt*), **Wolfgang Amadeus** (1756–91). Austrian composer, **2363, 2584,** *picture,* **2379;** friendship with Haydn, **1609.**
**Mucha** (*mŭ-shä'*), **Alphons** (born 1860). Hungarian painter; long resident in Paris, his work shows strongly modern Fr. influences; large historical scenes and smaller decorative paintings in delicate colors.
**Mu'cilage,** an adhesive solution; made of vegetable gums, **1552.**
**Mucous membrane.** A thin sheetlike structure lining all the passages by which internal organs of the body communicate with the outer world; it has certain cells which form a semi-fluid secretion called "mucus" to protect the membrane from irritation.
**"Mud-dauber,"** a wasp, **3692, 3693.**
**Mudfish,** types that burrow in mud, **2363–5;** classified, **1272.**
**"Mudhen,"** or coot, **880, 2961.**
**Mudjekee'wis,** in Hiawatha story, the West Wind, **2059.**
**Mud-minnow,** a mudfish, **2365.**
**Mud-puppy,** a salamander, **3113.**
**Mud-skipper,** or goby, E. Indian fish, **2364, 2365,** *picture,* **2364.**
**Mudstone,** a structureless clay rock, **3248.**
**Mud-terrapin,** *picture,* **3562.**
**Mud turtle, 3563.**
**Muezzin** (*mū-ĕz'in*), crier who calls Mohammedans to prayer, **2276.**
**Mugad'zhar Mts.,** in Asia, range extending from Ural R. s. almost to Aral Sea; 27,786 ft. highest peak; **3607.**
**Mugwumps,** in U.S. politics, **3248;** in election of 1884, **2871, 790, 435.**
**Mühlberg** (*mül'bĕrĸ*), Germany. Town on Elbe R. 35 mi. n.w. of Dresden; Emperor Charles V defeated Protestants under Elector of Saxony (1547).
**Muh'lenberg** (*mu'lĕn-bērg̃*), **Frederick A. C.** (1750–1801). Amer. Luth. clergyman, member of Continental Congress 1779–80 and House of Representatives 1789–97 (Speaker 1789–91, 1793–95).
**Muhlenberg, Henry Melchior** (1711–87). Amer. clergyman, b. Germany; emigrated to Philadelphia 1742 and organized first Luth. synod in Amer. 1748; real founder of Amer. Luth. church; father of John P. G. and Frederick A. C.
**Muhlenberg, John Peter Gabriel** (1746–1807). "Fighting parson" of the Amer. Rev., b. Trappe, Pa.; fought at Brandywine, Germantown, Yorktown, and brevetted maj.-gen.; statue stands in Statuary Hall of the national Capitol.
**Muhlenberg College.** At Allentown, Pa.; Luth. school for men; founded 1867; arts and science.
**Muir** (*mūr*), **A.,** Canadian song writer, **2405.**
**Muir, John** (1838–1914), Amer. naturalist and explorer, **2365;** quoted, **116, 586, 3831.**
**Muir Glacier,** large and picturesque ice sheet of s.e. Alaska, discharging into Glacier Bay; about 350 sq. mi.; discovered by John Muir, **2365.**
**Muir Woods,** Calif., **2400.**
**Mukden** (*mu̇k-dĕn'*), China, city on Hun R. 400 mi. n.e. of Peking; pop. 150,000; **2135, 2708;** Amer. consulate, *picture,* **747;** battle of, **3098.**
**Mulberry,** any of several trees with black, white, or red fruit, **2365–6,** *picture,* **3234;** bark, in paper-making, **2677, 1866;** classified, **3533;** in Japan, **1864, 1866;** in U.S., **3235.**
**Mulberry family** or *Moraceae,* plant family including mulberries, hemp, figs, and breadfruits, **3940.**
**Mulch,** layer of pulverized soil, **641.**
**Mul'de River,** Ger. r., rises in Erzgebirge and flows 150 mi. to Dessau, **1107.**
**Mule deer, 981,** *picture,* **980.**
**"Mule killer,"** a mantis, **2137.**
**Mules,** offspring of ass and mare; in Mo., **2270;** St. Louis market, **3109;** in Spain, *picture,* **3300;** in Tex., **3473,** *picture,* **2271.**
**Mulhacen** (*mu̇l-ä-thän'*). Highest summit in Spain, 11,420 ft.; in Sierra Nevada, s.e. of Granada.
**Mülheim-am-Ruhr** (*mül'hīm-am-rur*). Germany. Coal and iron-mining and mfg. town in Rhine Province of Prussia, pop. 127,000; on the R. Ruhr, 4 mi. n. of Dusseldorf.
**Mulhouse** (*mül-ȯz'*) (Ger. Mülhausen, *mül'hou-zĕn*), commercial center in Upper Alsace, France; pop. 95,000; large textile mfrs.; under Ger. rule 1871–1918; potash deposits, **2900, 103.**
**Mull,** isl. off w. coast of Scotland, 2d largest of Inner Hebrides; 367 sq. mi.; chief town Tobermory; **1625.**
**Mul'lah,** complimentary title given to Mohammedan priest, **381.**
**Mul'ler, Maud.** Heroine of Whittier's poem 'Maud Muller'.
**Müller** (*mü'lĕr*), **(Frederick) Max** (1823–1900), Eng. orientalist, Sanskrit scholar and popularizer of comparative philology ('Chips from a German Workshop'), **2771.**
**Mullet, banded,** a fish, *picture,* **1271.**
**Mullins, Priscilla,** one of *Mayflower* Pilgrims, **2176, 3338.**
**Mulock** (*mū'lŏk*), **Dinah Maria** (Mrs. Craik) (1826–87). Eng. novelist and children's story writer ('John Halifax, Gentleman'; 'The Adventures of a Brownie'; 'The Little Lame Prince').
**Multan** (*mu̇l-tän'*), India. Railroad center, 190 mi. s.w. of Lahore; pop. 100,000; silk and cotton mfrs.; large trade; captured by British 1849.
**Mul'tiplex telegraphy, 3456.**
**Multiplicand', 2366;** decimal, **974.**
**Multiplica'tion,** in arithmetic, **2366–8;** in algebra, **95;** calculating machines, **572;** of decimals, **972, 973, 974;** of fractions, **1339, 1340, 1341;** of mixed numbers, **1341.**
**Mul'tiplier, 2366;** decimal, **974.**
**Multno'mah Falls,** Oregon, *picture,* **2595.**
**Mulvaney** (*mŭl-vā'nĭ*), **Terence.** In 'Soldiers Three' and other tales by Kipling, a reckless resourceful Irish private in India.
**Mulvian Bridge.** Same as **Milvian.**
**Mum'michog,** a mudfish, **2365.**
**Mummy, 2369, 1099, 3155, 946,** *pictures,* **1104, 1206;** of animals, **1106;** in Peru, **904.**
**Mumps,** supposedly a germ disease, **1450.**
**Münchhausen** (*münĸ'hou-zĕn*), **Hieronymus Karl Friedrich, Baron** (1720–97). Ger. soldier, whose marvelous narratives of his exploits formed the basis of a collection of stories ('Munchausen's Travels', published 1785) by Rudolf Erich Raspe.
**Mun'cie,** Ind., city 51 mi. n.e. of Indianapolis on White R., in agricultural and natural gas region; pop. 36,524; glass jars, iron and steel products, automobiles, paper, silver; **1760.**
**Munda** (*mŭn'dä*). Anc. town in s. Spain where Caesar defeated sons of Pompey (45 B.C.); location undetermined.
**Mun'delein, George William** (born 1872). Rom. Cath. archbishop, b. New York; archbishop of Chicago since 1916.
**Munich** (*mū'nĭk*), 3d city of Germany and cap. of Bavaria; pop. 630,000; **2369–70, 347.**
**Munic'ipal government, 2370, 770;** borough system in New York City, **2498;** "commission" form, **1392;** federal plan, **2370, 3511–2;** fire department, **1257–60;** Glasgow system, **1470;** health department, **1612–5;** juvenile courts, **1906;** in London, **2056;** police, **2865–8;** public utilities, **2932, 766;** taxation, **3441–2.**
**Muninn** (*mu̇'nĭn*), in Norse myth., one of ravens of Odin, *picture,* **2561.**

**Munkacsy** (*mun'kä-chē*), **Michael** (1844–1900). Hungarian genre, religious, and historical painter, master of a dramatic style ('Milton Dictating Paradise Lost'; 'Christ before Pilate', whose living action, grandeur, and pathos have made some critics call it the greatest religious painting of 19th cent.).

**Munroe, Kirk** (born 1850). Amer. author, b. Prairie du Chien, Wis.; prolific writer of thrilling books of adventure for boys ('The Flamingo Feather'; 'The White Conquerors'; 'With Crockett and Bowie'; 'In Pirate Waters').

**Munsey, Frank Andrew** (born 1854). Amer. newspaper and magazine publisher; founded *Munsey's Magazine* and other popular periodicals; bought New York *Sun* in 1916, and New York *Herald* in 1920.

**Munson shorthand,** 3224–5.

**Münster** (*mün'-stĕr*). City in w. Germany, 80 mi. n.e. of Cologne; Dortmund-Ems Canal; pop. 100,000; textile and leather mfrs.; univ.; Peace of Westphalia signed here 1648.

**Munster.** Largest of 4 provinces of Ireland, in s.w.; 9532 sq. mi.; pop. 1,035,000.

**Münsterberg, Hugo** (1863–1916), Ger.-Amer. psychologist, b. Danzig; professor of psychology and director of laboratories at Harvard after 1892 ('American Traits'; 'On the Witness Stand'; 'Psychology and Life'); defines mission of art, **1243.**

**Munt'jac,** "barking deer" of India, **981.**

**Mura, Lake,** Yosemite National Park, *picture,* **3831.**

**Murat** (*mü-rä'*), **Joachim** (1767–1815), Fr. Rev. cavalry leader, and marshal of the empire; husband of Napoleon's youngest sister Caroline; made king of Naples 1807; dethroned and shot by Allies; **452.**

**Muratore** (*mü-rä-tôr'*), **Lucien.** Fr. operatic tenor, b. Marseilles; with Chicago Grand Opera Company since 1912.

**Murcia** (*mûr'shĭ-ȧ*), Spain. Industrial center, cap. of province of same name in s.e., on R. Segura; pop. 134,000; silk industry.

**Murder,** punishment for, **2919.**

**Murdock, William** (1754–1839), Scotch engineer, inventor of coal-gas lighting, **1406.**

**Mu'rex,** genus of mollusks that secrete Tyrian purple, **2774;** shell, *picture,* **3201.**

**Mur'free, Mary Noailles** (1850–1922). Amer. novelist, b. Murfreesboro, Tenn.; early work published under pen name of "Charles Egbert Craddock" ('The Prophet of the Great Smoky Mountains' and other stories of Tennessee life).

**Murfreesboro,** Tenn., city 33 mi. s.e. of Nashville; pop. 5367; cap. of state 1819–26; cotton trade; battle of Murfreesboro on Stone R., **1361, 3490;** normal school, **3468.**

**Muriat'ic acid.** Same as **Hydrochloric acid.**

**Murillo** (*mū-rĭl'ō*, Span. *mu-rēl'yō*), **Bartolomé Esteban** (1617–82), Span. painter, **2370–2;** contrasted with Velasquez, **3620.**

**Mur'man Coast,** Russia. Arctic coast of Kola peninsula, **3085, 3094.**

**Murphy, Charles Francis** (born 1858). Amer. politician, Croker's successor as leader of Tammany.

**Murphysboro,** Ill. Industrial city on Big Muddy R. 140 mi. s. of Springfield; pop. 10,703; in agricultural, coal, shale, and timber region and fruit belt; foundry products, flour, lumber, bricks.

**Murray, (George) Gilbert (Aimé)** (born 1866). Brit. classical scholar, best known for translations of plays of Euripides in Eng. verse ('History of Ancient Greek Literature'; 'Rise of the Greek Epic'; 'Four Stages of Greek Religion').

**Murray** or **Moray, James Stuart, Earl of** (1531?–70), half-brother of Mary Queen of Scots and her chief adviser on her return from France; her chief enemy after her open break with Protestantism, and regent for the infant James after Mary's abdication; **1941, 2158.**

**Murray, Sir John** (1841–1914). Brit. oceanographer, b. Cobourg, Ontario; edited reports of the *Challenger* expedition, and wrote numerous books and papers on scientific subjects.

**Murray, Lindley** (1745–1826). Amer. grammarian, b. Swatara, Pa. ('Grammar of the English Language', recognized standard in England and America for 50 years).

**Murray River,** chief r. of Australia, draining, with Darling tributary, entire s.e. quarter; mouth on s. coast 40 mi. e. of Adelaide; **262,** *map,* **264–5.**

**Murre** (*mûr*), a guillemot, bird of the auk family; nest and eggs, *picture,* **407.**

**Murzuk',** a caravan station in Libya (Tripoli); cap. of Fezzan; **3105.**

**Mus** (*mŭs*), the mouse and rat genus of rodents, **2978, 2359.**

**Musa** (*mū'zȧ*), the banana genus of plants, **324–6.**

**Musaeus** (*mū-sē'ŭs*) (5th or 6th cent. A.D.), Gk. grammarian and poet; story of Hero and Leander; **1645.**

**Mus'ca,** insect genus including common flies, **1313.**

**Musca domestica,** the housefly, **1313.**

**Mus'carine,** a poison found in certain mushrooms, **2375.**

**Muscat,** Arabia. Same as **Muskat.**

**Mus'cat** or **mus'catel,** one of several varieties of musk-flavored grapes, usually light colored, **1502, 2974.**

**Muscatine',** Iowa. Industrial and trade center on Mississippi R. 25 mi. s.w. of Davenport; pop. 16,068; known for watermelons and sweet potatoes grown on Muscatine Isl. near by; makes pearl buttons, sashes and doors.

**Musci** (*mŭs'ī*), the moss class of bryophyte plants, **2340, 3938.**

**Muscles, 2372–3;** attachment to bones, **3245;** of birds, **400–1;** of bivalve mollusks, **2614, 782,** *picture,* **2615;** cells in muscle fiber, **672;** diaphragm muscle, **1005;** of eye, **1213,** *pictures,* **1213, 1214;** give impressions of weight and position, **3521;** growth affected by pituitary secretion, **1470;** of insects, **1787;** shape of cell, **672;** of stomach, **3360;** of tongue, **3513.**

**Muscle sense,** 3521.

**Muscle Shoals,** Ala., rapids 37 mi. long in Tennessee R., capable of developing enormous hydroelectric power; during World War U.S. built immense nitrate plant here and began Wilson Dam to supply power; work suspended at close of war after expenditure of $105,000,000; negotiations opened for private completion and operation of project; **72.**

**Mus'covite** or **muscovy glass,** a form of mica, **2219.**

**Mus'covy,** former name for Russia, **3084.**

**Muscovy Company,** Eng. company formed for trade with Russia and polar exploration, **1690, 2860.**

**Mu'ses,** in Gk. myth., goddesses presiding over the arts and sciences, **2373,** *picture,* **156.**

**Museum** (*mū-zē'ŭm*), original meaning of word, **2373.**

**Mushet** (*mŭ-shĕt'*), **Robert F.** (1811–91), Eng. metallurgist, **99.**

**Mush'rooms,** various types of edible fungi, **2374–5, 2831,** *pictures,* **2821, 2823.**

**Music, 2376–81;** Bach's influence, **300;** Beethoven's influence, **366;** early Christian, **2377;** folk songs, **1316, 1318;** great names in musical history, list, **2380–1;** Greek, **2376–7;** Hebrew, **2376;** modern, **2378–80;** opera, **2584;** orchestra, **2590–1;** phonograph, **2774–6;** relation to poetry, **2850;** Richard Strauss's innovations, **3369–70;** physical basis, **3278;** time, **3502;** Wagner's influence, **3663.** *See also in Index* under names of great musicians.

**Musical comedy,** 2584.

**Musical instruments, 2381–3;** bagpipe, **305;** banjo, **326;** bells, **377–9;** clavichord, **2797;** drum, **1042;** guitar, **1548;** harp, **1589–91;** harpsichord, **2797;** horns, **1680–1;** mandolin, **2135;** in orchestra, **2590–1;** organ, **2598–2600;** phonograph, **2774–6;** piano, **2797–2801;** spinet, **2797;** tone or "timbre," **3278;** ukulele, **3575;** violin, **3645–6;** woodwinds, **3781.**

**Musical rotation,** 2376, 2377.

**"Musical sands,"** 3122.

**Music-dramas,** of Wagner, **3663.**

**Musk,** a perfume obtained from glands of animals, especially musk deer, **2728, 2383;** from crocodile, **923.**

**Muskat', Muscat,** or **Maskat,** seaport and cap. of independent state of Oman in e. Arabia; pop. 24,000 with Muttrah; chief export, dates; name sometimes given to Oman itself; **166, 3837.**

**Musk beetle,** *picture,* **367.**

**Musk deer, 2383,** *picture,* **979;** altitude range, *picture,* **397.**

**Muske'gon,** Mich. Shipping center on Muskegon L. between L. Michigan and Muskegon R., 32 mi. n.w. of Grand Rapids; pop. 36,570; all-year steamship service to important lake ports.

**Mus'kellunge** or **maskinonge,** a fish of the pike family, **1278.**

**Musket, 1252, 1254,** *picture,* **1253.**

**Muskhog,** or peccary, **2706.**

**Muskin'gum College.** At New Concord, Ohio; co-ed.; United Presb.; founded 1837; arts and science.

**Muskingum River,** in Ohio, formed by union of Walhonding and Tuscarawas rivers; flows 120 mi. into Ohio R.; **2573.**

**Musk'melon, 2195–6.**

**Muskogee** (*mŭs-kō'gē*), Okla., mfg. city and distributing center in e. near Arkansas R.; pop. 30,277; in agricultural and stock-raising region; oil and natural gas near by; **2576.**

**Musko'ka Lake region,** in Ontario, Canada; Muskoka R., Muskoka and numerous other lakes; **1970.**

**Musk ox, 2383–4;** in Ice Age, **1721;** in Laurentian Plateau, **1970.**

**Muskrat, 2384–5;** adaptation to surroundings, **1076;** fur, **1390, 3528.**

**Musk tortoise,** or "skunk turtle," **3563.**

**Muslin,** name given to various kinds of cotton cloth, **804.**

**Musquash.** Same as **Muskrat.**

**Musschenbroek** (*mŭs'kĕn-bruk*), **Pieter van** (1692–1761), Dutch physicist; electrical experiment, **1118.**

**Mus'sel,** a bivalve mollusk, **783, 2280;** Iowa fisheries, **1806;** partnership with king crab, **912;** pearls, **2703;** shells made into buttons, **549.**

**Musset** (*mü-sā'*), **Alfred de** (1810–57), Fr. dramatist, poet, and novelist, **1365.**

**Mustache monkey,** 2291.

**Mustagh** (*mus-täĸ'*) **Mts.** Same as **Karakoram Mts.**

**Mus'tangs,** or Indian ponies, **1684.**

**Mustapha** (*mus'tä-fä*) **IV** (1779–1808). Sultan of Turkey, placed on throne by the Janissaries who rebelled against Selim III in 1807; deposed and killed.

**Mustapha Kemal Pasha.** *See in Index* **Kemal Pasha.**

**Mustard,** plant having pungent seeds used as condiment and in medicine, **2385;** belongs to cabbage family, **533–4;** contains sulphur compounds, **3389;** in India, **1751.**
**Mustard gas, 1408.**
**Mustel'idae.** or weasel family, long-bodied carnivorous animals, such as weasels, mink, and skunks, **304,** *picture,* **3776.**
**Muta'tion theory,** of evolution, **1201–1.**
**Mutsuhito** (*mụt-sụ-hē'tō*) (1852–1912), emperor of Japan, **1869–70.**
**Mutton,** meat of grown sheep, **3198, 3199, 3200.**
**Mu'tualism,** plant partnership, **1994.**
**Muybridge, Edward** (or Eadweard) (1830–1904), Eng.-Amer. photographer, **2352.**
**Muzaffar-ed-Din** (*mụ-zŭf'ar-ĕd-dēn'*) (1853–1907). Shah of Persia; came to throne 1896; filled depleted treasury by loans; widespread discontent forced grant of liberal constitution (1906).
**Muzhik** (*mụ-zhĭk'*), Rus. peasant, **3087, 2332.**
**Mvule,** an African timber tree, **3433.**
**Mycale** (*mĭk'ȧ-lē*). Mt. in anc. Ionia, Asia Minor, near which Greeks destroyed Persian fleet 479 B.C.
**Myce'lium,** food-getting body of a fungus, **3938;** of rust, **3099;** underground in mushrooms, **2374.**
**Mycenae** (*mī-sē'nē*), anc. Gk. city in Argolis, 50 mi. n.e. of Sparta, destroyed 5th cent. B.C. by Argos; early civilization, **27, 28, 29.**
**Myceri'nus** or **Menkaura,** king of Egypt, son of Khufu (Cheops); pyramid of, **2939,** *pictures,* **2940, 570.**
**Myce'tozoa,** the slime molds when classified as animals, **3251, 3944.** *See also in Index* **Myxomycetes.**
**Mycol'ogy,** science of fungi, **475.**
**Myo'pia,** or near-sightedness, **1214.**
**Myr'iagram,** a unit in metric system (22.046 lbs.), **2206.**
**My'riapods,** a class of many-legged arthropods including centipedes and millipedes, **3946,** now often replaced by two classes, the chilopods (centipedes) and diplopods (millipedes).
**Myr'midons.** A warlike race of anc. Thessaly led by Achilles in the Trojan War; term now used of devoted and unquestioning followers.
**Myrob'alan,** a prune-like fruit used in tanning, **1976.**
**Myron** (*mī'rŏn*) (5th cent. B.C.), Gk. sculptor; 'Discobolus', **1530,** *picture,* **1204.**
**Myrrh** (*mĕr*), a fragrant gum resin, in perfumes, **2728.**
**Myrtle,** an evergreen shrub or tree, **2385.**
**Myrtleberry wax, 3706.**
**Myrtle family,** or *Myrtaceae,* family of trees and shrubs such as myrtles and cloves, often with pungent oils in leaves or berries, **3942.**
**Myrtle warbler, 3669,** *picture,* **420.**
**Mysia** (*mĭsh'i-ȧ*), anc. dist. of n.w. Asia Minor inhabited by the Mysi; *map,* **1518.**
**Mysore** (*mī-sōr'*), native state in s. India; 29,475 sq. mi.; pop. 5,900,000; cap. Mysore (pop. 72,000); chief city Bangalore; won by English 1799 by defeat and death of Tipu Sahib, son of Hyder Ali; **1746,** *map,* **1745;** gold mines, **1479;** giant bull of Siva, *picture,* **1749;** Hastings crushes sultan, **1753.**
**Mysteries, Eleusinian, 993.**
**Mystery plays,** medieval plays depicting stories from Bible, **2259, 1033.**
**"Mystery" ships,** in World War, **3378.**
**Mystic River,** outlet of Mystic Lakes, Mass.; enters Boston harbor by wide estuary; towns on, **472.**
**Mythology, 2385–6;** as literature for children, **2027.** For detailed references to the many mythological articles in these volumes *see* Study Outline, **3981-5.**
**Mytile'ne** or **Mityle'ne,** anc. Lesbos, Gk. (formerly Turkish) isl. in Aegean Sea off coast of Asia Minor; 675 sq. mi.; pop. 182,000; famous school of poetry, 7th cent. B.C.; chief product olive oil; *map,* **1518.**
**Myt'yl,** in Maeterlinck's 'Blue Bird', **2112–5.**
**Myxede'ma,** disease caused by lack of thyroid secretion, **1469.**
**Myxomycetes** (*mĭks-ō-mī-sē'tēz*), the slime molds when classed as plants, **3251, 3938.** *See also in Index* **Mycetozoa.**

# N

THE series of little waves which formed the Egyptian sign called the "water line" ≈≈≈ was the ancestor of our letter N. When written in running hand, the undulations tended to disappear and the character assumed the form  which looked more like a fish. The Phoenicians and Hebrews called it *Nun*, the word for "fish" in their language, but they still further modified it  so that we might be inclined to say it looked more like a fish-hook than a fish. So it passed to the early Greeks and Latins, who, straightening the lines and making them of more even length, evolved the letter N. As M is a labial or "lip" nasal, so N is a dental or "tooth" nasal. The sound is made by bringing the end of the tongue in contact with the upper teeth or gums and sending the breath through the nose while the vocal chords are vibrating.

**Nablus** (*nä-blụs'*), Palestine. Same as **Shechem.**

**Na'bob,** meaning of word, **1596.**

**Nabonas'sar.** King of Babylonia 747–734 B.C.; seems to have been vassal of Tiglath-Pileser IV, who permitted his defeated foe to remain in nominal independence.

**Naboni'dus.** Last ruler of Chaldean Empire, and father of Belshazzar; succeeded to throne 556 B.C., but gave more time to building temples than to preparing for resistance to the Persians, who took him prisoner in 538 B.C.

**Nabopolas'sar.** King of Babylonia 625–605 B.C., founder of the Chaldean Empire; aided by Medes he captured Nineveh in 606 B.C.; father of Nebuchadnezzar.

**Naboth** (*nā'bŏth*). Owner of a vineyard coveted by Ahab, and obtained by Jezebel through murderous fraud (I Kings xxi).

**Nacre** (*nā'kẽr*), or mother-of-pearl, **2703, 3201, 3202.**

**Nadir Shah** (*nä'dẽr shä*) (1688?–1747), ruler of Persia, **990, 1004.**

**Naevius** (*nẽ'vĭ-ŭs*), **Gnaeus,** first Rom. epic poet (3d cent. B.C.), **1966.**

**Nagana** (*nä-gä'nà*), a disease of animals, **3546.**

**Nagasaki** (*nä-gä-sä'kē*), Japan. Important seaport on s.w. coast of Kyushu isl.; pop. 177,000; coal, cotton goods, rice exports; shipbuilding.

**Nagoya** (*nä-gō'yä*), 5th city of Japan; pop. 430,000; **2387.**

**Nagpur** (*näg-pụr'*), India, trade city of Cent. Provinces, 450 mi. n.e. of Bombay; pop. 102,000; r.r. center; cloth mfrs., manganese mines; **1746.**

**Nagy-Szeben** (*nŏdj-sĕ'bĕn*). Same as **Hermannstadt.**

**Nagy-Varad** (*nŏdj-vä'rạd*), also **Grosswardein** and **Oradea Mare.** City in w. Rumania; pop. 65,000; old Hungarian town founded by St. Ladislaus (1080); important r.r. junction; potteries; agricultural trade.

**Nahua** (*nä'hwä*) **nations,** Indian tribes inhabiting Mexico in 15th cent., **290, 288.**

**Nahum** (*nā'hŭm*) (7th cent. B.C.). Hebrew minor prophet; his book, the 34th of the Old Testament, foretells the doom of Nineveh.

**Naiads** (*nā'yăds*), in Gk. myth., spirits of the springs and fountains, **2546.**

**Nails,** of fingers and toes, **3246, 1680, 1571.**

**Nails,** hardware, **2387–8.**

**Nairobi** (*nī-rō'bĭ*), cap. of Kenga Colony, Brit. E. Africa; pop. 14,000; game-outfitting point, **1068.**

**Names, personal, 2388–9;** superstitions about, **2118.**

**Namur** (*nä-mür'*), Belgium. Fortified industrial town 35 mi. s.e. of Brussels at junction of Sambre and Meuse rivers; pop. 32,000; repeatedly besieged; occupied by Germans 1914.

**Nanai'mo,** British Columbia. Port on Vancouver Isl. opposite Vancouver; in coal-mining region; pop. 9500; exports coal, lumber, herring; various mfrs.

**Nana Sahib** (*nä'nä sä'ĭb*) (1825?–60?), Hindu prince, leader of Indian Mutiny of 1857, **1753.**

**Nancy** (*näṅ-sē'*), France, fortified city 175 mi. e. of Paris; pop. 120,000; noted univ.; unsuccessfully besieged by Germans 1916; battle (1477), **697;** old city gate, *picture,* **1342.**

**Nankeen',** a cloth, **2389.**

**Nanking',** China, city on Yangtse R.; pop. 400,000; **2389;** students' cells, *picture,* **746.**

**Nankow Pass,** in Great Wall of China, **2708.**

**Nansei** (*nän-sā'*) **Islands,** also **Liukiu,** or **Riukiu,** Japan, group of small isls. stretching n.e. from Formosa to Kyushu; 941 sq. mi.; **1863,** *map,* **1864.**

**Nansen** (*nän'sĕn*), **Fridtjof** (born 1861), Norwegian scientist and explorer; Arctic explorations, **2862,** *maps,* **189, 1540.**

**Nantes** (*nänt*), historic city and seaport of France; pop. 170,000; **2389–90, 2047.**

**Nantes, Edict of** (1598), decree granting religious freedom to Fr. Huguenots, **1696, 1637, 2389.**

**Nanteuil** (*näṅ-tû'yē*), **Robert** (1630–78). Fr. portrait engraver, whose heads show masterly modeling and precise draftsmanship; one of the greatest engravers of all time.

**Nan'ticoke,** Pa. Coal-mining town on the Susquehanna R. 7 mi. s.w. of Wilkes-Barre; pop. 22,614; mining and agricultural implements, hosiery and silks, canned goods.

**Nantucket** (*năn-tŭk'ĕt*) **Island,** off s.e. coast of Mass.; separated from Cape Cod by Nantucket Sound; town of Nantucket, a summer resort; **2170;** lightship, **2006;** Cape Cod canal, **640.**

**Nao'mi,** mother-in-law of Ruth, **3101–2.**

**Nap,** of cloth, how raised, **3787, 3489–90,** *picture,* **3786.**

**Napaeads** (*nă-pē'ăds*), in Gk myth., nymphs of valleys, **2546.**

**Na'perville,** Ill. City 28 mi. w. of Chicago; pop. 3830; Northwestern College.

**Naph'tha,** an oil distilled from petroleum, **2753–4, 3072.**

**Naph'thalene,** a coal-tar product, **814, 816.**

**Naphtha soap, 3267.**

**Napier** (*nāp'yẽr*), **Sir Charles James** (1782–1853). Eng. general, fought in Spain and France in Napoleonic wars; in 1841 in India commanded army which conquered the Sind, and for 6 years successfully governed the territory he had conquered; a brave but rash soldier, beloved by his men.

**Napier, John** (1550–1617), Scotch mathematician, inventor of logarithms, **2174.**

**Napier.** Port on e. coast of North Isl., New Zealand; pop. 16,000; wool and meat exports.

**Napier of Magdala, Robert Napier,** first **Baron** (1810–90). Brit. soldier, took part in first and second Sikh wars, relief of Lucknow, and later Indian campaigns; commanded expeditions which stormed Pei-ho ports in China 1860, and Magdala, cap. of Abyssinia in 1868.

**Na'ples,** largest city of Italy; pop. 700,000; **2390–1;** aquarium, **162, 2390;** relics of Pompeii, **2877, 2390;** street scenes, *pictures,* **1839, 1842;** Mt. Vesuvius, **3635–6.** —*History,* **2390–1;** Norman kingdom, **2513;** annexed to Holy Roman Empire, **1633;** "Two Sicilies," **3230;** Charles VIII captures, **696;** Joseph Bonaparte king, **451;** Garibaldi conquers for Italy, **1399, 1837–8.**

**Naples, Bay of,** inlet of Mediterranean in s.w. Italy, famous for scenery, **2390.**

**Naples, University of,** the largest univ. of Italy; has nearly 7000 students; **2390, 2391.**

**Napo** (*nä'pō*). River rising in Ecuador; flows 700 mi. s.e. to Amazon.

**Napoleon** (*nà-pō'lā-ôn*) **I** (1769–1821), emperor of the French, **2391–6;** early life and rise to power, **2391–4, 1370;** family, **451–2;** elected First Consul, **2394;** emperor of the French, **2395–6, 1370, 2442;** founds sugar beet industry, **3385;** governmental reforms, **2394–5;** marriage to Josephine Beauharnais, **1901, 2391;** marriage to Marie Louise, **2395,** *picture,* **2393;** member of French Institute, **4;** relations with Alexander I, **2396, 85, 871;** relations with Ney, **2500–1;** relations with Talleyrand, **3430;** sells Louisiana to U.S., **2072–3;** return from Elba and final exile, **2396, 3699–3700, 2067;** tomb, **2684.** For military campaigns *see in Index* **Napoleonic Wars.**

**Napoleon II.** *See in Index* **Reichstadt, Duke of.**

**Napoleon III** (1808–73), emperor of the French, **2397;** aids Sardinia-Piedmont against Austria, **670, 1837, 3638, 2983, 1399;** and Amer. confederacy, **781;** beautifies Paris, **2685;** Franco-Prussian War and surrender at Sedan, **1355–6, 3171;** Mexican expedition, **2397, 2216, 1898;** opposed by Victor Hugo, **1694.**

**Napoleonic code,** 2394–5, 2071, 3778.
**Napoleonic Wars** (1796–1815), 2392–6; chief events summarized, 1659; Italian campaign (1796), 2392–3; Egyptian expedition and battle of the Nile, 2435, 2131, 1107; battle of the Baltic (1801), 321, 2435; treaty of Amiens, 2394, 117; battle of Trafalgar (1805), 2435–6, 1154; battle of Jena, 2394, 2929; Treaty of Tilsit (1807), 2396, 85; "continental system" and U.S., 2396, 1140, 3670, 3671; Peninsular War, 2396, 2890, 3717; Russian invasion and retreat from Moscow (1812), 2396, 2501, 2333, *picture*, 2394; Waterloo, 3699–3700. *See also in Index* **Vienna, Congress of.**
**Narba'da** or **Nerbudda** (*nĕr-bŭd'ä*), r. in India, rising in n. of Central Provinces, flowing 750 mi. to Gulf of Cambay; held sacred by Hindus; *map*, 1744.
**Narbonne** (*när-bŏn'*). Town in s. France 5 mi. from Mediterranean; pop. 28,000; coopering, distilling; early Rom. colony, Narbo Martius.
**Narcissus** (*när-sis'ŭs*), in Gk. myth., 2397, 1073.
**Narcissus,** plant, 2397–8.
**Narghile** (*när'gĭ-lā*), oriental tobacco pipe, *picture*, 2735.
**Narragan'sett Bay,** inlet of Atlantic, indenting coast of R.I.; 3008, 2927, *map*, 3009.
**Narragansetts,** tribe of Algonquian Indians; lived along w. side of Narragansett Bay, R.I., and controlled surrounding regions; befriended Roger Williams; 1765, 2841.
**Narses** (*när'sēz*) (478?–573?), general of the Byzantine Empire, grand chamberlain to Justinian; in Italy, 1905.
**Narva** (*när'vä*), Esthonia, seaport on Rus. frontier; pop. 35,000; cotton and lumber trade; makes textiles; battle, 698.
**Narvaez** (*när-vä'äth*), **Pánfilo de** (1480?–1528), Span. soldier and adventurer, one of earliest explorers of Fla.; perished on expedition; *map* of exploration, 1296–7.
**Nar'vik,** Norway, port on w. coast; pop. 5000; r.r. terminus, 2534, 3404.
**Nar'whal,** a cetacean, 2884, 3723; ivory obtained from teeth, 1853.
**Nas'by, Petroleum V.** Pen name of David R. Locke (1833–88), Amer. humorist, author of the "Nasby letters" in favor of the Lincoln policy in the Toledo *Blade* during Civil War.
**Naseberry** (*nāz'bĕr-ĭ*), S. Amer. tree, 1552, 719.
**Naseby** (*nāz'bĭ*), **battle of** (1645), 924, 693, 3149.
**Nash, Richard** (1674–1762). Eng. society leader, popularly called "Beau" Nash; he made Bath a resort of fashion and ruled it like a monarch.
**Nash'ua,** N. H., mfg. city on Merrimack and Nashua rivers, 34 mi. n. w. of Boston; pop. 28,379; fish hatchery; 2454, 2456.
**Nashville,** Tenn., state cap. on Cumberland R.; pop. 118,342; 2398, 3468; capitol, *picture*, 3467; home of Andrew Jackson, 1858.
**'Nashville',** Confederate privateer, *picture*, 777.
**Nashville, battle of,** 2398.
**Nasmyth** (*nā'smĭth*), **James** (1808–90), Scotch engineer and inventor; invents steam-hammer, 1826, 1799.
**Nasr-ed-Din** (*näsr-ĕd-dēn'*) (1829–96), Shah of Persia; succeeded 1848; able ruler; introduced postal system and other reforms.
**Nassau** (*nă'sou*), cap. and seaport of Bahama Isls. (Brit.); pop. 11,000; on New Providence Isl., 200 mi. s.e. of Miami, Fla.; 305.
**Nassau,** Germany, part of the province of Hesse-Nassau, Prussia; until 1866 an independent duchy; Prussia absorbs. 2929, 1448.
**Nassau grouper,** a fish, *picture*, 2925.
**Nast, Thomas** (1840–1902). Amer. caricaturist, b. Bavaria; called by Lincoln during Civil War "our best recruiting sergeant"; best work terrific cartoons in *Harper's Weekly* which helped destroy Tweed ring; originated many still current political emblems—Democratic donkey, Republican elephant, and Tammany tiger.
**Nastur'tium,** 2398; pollen grain, *picture*, 1309.
**Natal** (*nä-tăl'*), province of Union of South Africa; 35,291 sq. mi.; pop. 1,200,000; cap. Pietermaritzburg; 2398, 3279, 3280, 3282, 3283, *maps*, 3282, 40–1; Tugela R., *picture*, 3281.
**Natch'ez,** Indian tribe of s. U.S., formerly lived in Miss. about present city of Natchez, 1766.
**Natchez,** Miss., industrial city and port on Mississippi R.; pop. 12,608; exports cotton, rice, and sugarcane; cotton and cottonseed-oil mills, packing plants, lumber mills; settled as Ft. Rosalie by Bienville (1716); shelled in 1862, and occupied by Federal troops in 1863; 2264, 2266.
**Na'than.** Hebrew prophet; rebuked David for treachery to Uriah (II Samuel vii, xii).
**'Nathan the Wise'.** Dramatic poem by Lessing, a monument to the philosopher Moses Mendelssohn; story based on tale of Melchisedec the Jew in the 'Decameron'.
**Na'tick,** Mass. Town on Charles R. at head of Cochituati L. 15 mi. s. of Boston; pop. 10,907; boots and shoes, clothing, athletic supplies; founded about 1651 by John Eliot as a home for Indian converts.
**Nation,** distinguished from country, 3346–7.
**National Academy of Design, The.** Incorporated under present name 1828; in 1906 Society of American Artists was merged into the Academy; number hitherto limited to 100, being increased to 125 painters, 25 sculptors, and 25 architects and engravers; school of design in connection; headquarters New York City.
**National Academy of Sciences.** Amer. society incorporated 1863 for purpose of making investigations and reports on any subject of science or art at call of U. S. govt.; members number about 140 with about 45 foreign associates; meetings held in Washington, D.C.
**National American Woman Suffrage Association,** 149, 3778.
**National Assembly,** of France, 1350–1; in Fr. Rev., 1179, 1367–8.
**National banks.** *See in Index* **Banks and banking.**
**National Consumers' League,** organized 1898 to regulate conditions of manufacture by helping to enforce labor laws, investigating conditions of labor, etc., and awarding league's label to manufacturers conforming to its standard; state leagues have existed in U.S. since 1891; opposes sweatshops, 3400.
**National debt,** 2399; funded in U.S., 3677, 1569.
**National Gallery,** London, 2055, 2056.
**National Geographic Society,** 1416.
**National Guard,** U.S., in World War, 3801, 3802. *See also in Index* **Militia.**
**National League of Women Voters,** 3778.
**National Museum of the United States.** A depository of govt. historical and scientific collections at Washington, D.C.; established 1846 as a branch of Smithsonian Institution; present name adopted 1876; two buildings built by Congressional appropriation 1879 and 1903; material relating to N. America particularly valuable.
**National parks,** 2399–2403, *map*, 2400; Glacier, 1466; Grand Canyon, 1495–7; Hot Springs, 207; Lafayette, 2128; Mesa Verde, 794; Mt. Rainier, 3687; Rocky Mts. Park, Alberta, 2400, 83, *picture*, 603; Wind Cave, 3296; Yellowstone, 3829–30; Yosemite, 3831–2, *picture*, 586. *See also in Index* names of various parks.
**National Pike** or **Cumberland Road,** 3024, 1762, *picture*, 3025.
**National songs,** 2404–5.
**National Woman's Party,** 3779.
**National Woman Suffrage Association,** 3778, 149.
**Nativity, Church of the,** at Bethlehem, 387.
**Nativity plays,** 758.
**Natron** (*nā'trŏn*), sodium carbonate crystallized with water, 1471.
**Nattier** (*nä-tyā'*), **Jean Marc** (1685–1766). Fr. portrait painter; portraits of Peter the Great and Empress Catherine and of artificial ladies of Louis XV's court ('Marie Leczinska', 'Magdalen' in Louvre).
**Natural bridges,** caused by stream erosion, wave action, solution, etc.; there are about 50 in U.S.; Rainbow Bridge, in Ariz., *picture*, 203; in Utah, 3609, *map*, 3610; in Va., 3648.
**Natural cement,** 674, 676.
**Natural gas.** *See in Index* **Gas, natural.**
**Natural history,** the study of plants, animals, and the outdoor world, 393, 2786. *See also in Index* **Botany; Nature study; Zoölogy.**
**Naturalism,** in Fr. fiction, 3840.
**Naturaliza'tion,** admission of an alien to citizenship, 2405, 768; not recognized in 1812, 3670.
**Naturalization, Bureau of,** U.S., 3600.
**Natural selection,** Darwin's idea, 964; results in "survival of the fittest," 1210.
**Nature study,** 2406–17, 3142–3, *Study Outline*, 3847–60.
**Nature worship,** 2385–6; anc. Egypt, 1106; Hinduism, 1651; Hittites, 1669; Japan, 1868; Phoenicians, 2774. *See also in Index* **Animal worship.**
**Naucratis** (*nạ'krà-tĭs*), prosperous Gk. colony in 6th cent. B.C. on Nile Delta, Egypt, 50 mi. s.e. of Alexandria, 1520.
**Nau'gatuck,** Conn. Borough on Naugatuck R. about 5 mi. s. of Waterbury; pop. 15,051; largest plant in world for reclaiming old rubber; makes chemicals, rubber footwear, iron products.
**Nauheim** (*nou'hīm*), Germany, watering place in Taunus Hills 22 mi. n. of Frankfort-on-the-Main; pop. 5000; saline springs, 1357.
**Nauru Island,** small coral isl. in Pacific just s. of equator; 8 sq. mi.; Brit. mandatary; captured from Germans in World War; estimated deposits of guano 100,000,000 tons; *map*, 2624–5.
**Nau'sea,** treatment for, 1270.
**Nausicaä** (*nạ-sĭk'ā-ä*), in the 'Odyssey', Phaeacian princess who befriends the shipwrecked Odysseus, 2563–4.
**Nautch dancer,** of India, *picture*, 1751.
**Nautical mile,** 3715; how measured at sea, 2045.
**Nau'tilus,** a mollusk, 2418; a cephalopod, 2280; pearly, *picture*, 3203.
**Nauvoo',** Ill., village on Mississippi R. 40 mi. n. of Quincy; pop. 972; founded by Mormons 1839; pop. in 1846, 15,000; 2326–7.
**Navajos** (*năv'ä-hōz*) or **Navahos,** Indian tribe living in s.w. U.S., 1767; in Ariz., 202; 'Bayeta's Grandmother's Blanket', story, 204–7; blankets and rugs, 205–7, 3079; in N.M., 2467.
**Naval Academy, United States,** 2418–9.

**Naval and Military Order of the Spanish-American War,** 2695.
**Naval Observatory,** Washington, D.C., 2551, 3684, 3500–1; transit, *picture,* 3500.
**Naval Order of the United States,** 2695.
**Naval stores,** turpentine products commonly used on shipboard, usually including resin, tar, and various paints and varnishes; in Ga., 1432; N.C., 2519; paints and varnishes, 2642–3; resins, 2997; tar, 3436; turpentine, 3561–2.
**Navarino** (*nä-vä-rē'nō*), **battle of** (1827), in which Fr., Rus., and Eng. fleets, in defense of Greece, fought Turks in Bay of Navarino on s.w. coast of Greece, 1526.
**Navarre** (*nä-vär'*), medieval kingdom on both sides of w. Pyrenees; now divided between France and province of Navarra in Spain; Henry IV of France, king, 1637; struggle with Moors, 3304.
**Navar'ro, Mary Anderson de.** *See in Index* **Anderson, Mary.**
**Navas de Tolosa** (*nä'väs dā tō-lō'sä*), **battle of** (1212), 2323, 3304.
**Nave,** in architecture, 180, *diagram,* 186; of Pisa cathedral, *picture,* 184; Westminster Abbey, *picture,* 3719.
**Naviga'tion,** 2420–2, 3144; almanacs, 2551; charts and maps, 2142–3, 3398, 3599; compass, 853–4, *picture,* 855; earliest means, 3524; latitude and longitude determinations, 1968; lighthouses, lightships, and buoys, 2003–6, 8; precautions against icebergs, 1721–2; ship's log, 2045–6; signaling at sea, 3233; tide tables, furnished by governments, 3498; time at sea, 3501–2; winds, 3750–1; use of wireless, 2146, 2551, *picture,* 3761. *See also in Index* **Ships;** and the principal topics above by name.
**Navigation Acts,** English, 3000, 3001.
**Navigator Islands,** former name of Samoa Isls. *See in Index* **Samoa.**
**Navy,** 2422–8; armor-piercing shells, 634; armor-plate, 216; cannon used, 633–6; history of development, 2426–8; Fulton builds first steam warship, 1381; Greek and Roman war vessels, 3207; ironclads introduced, 2428, 2287; marine engineering, 1149; modern war vessels, 2423–4; "mother ship" for airplanes, *picture,* 2428; oil as fuel, 3214; seaplanes, 60, *picture,* 63; submarines, 3375–8; torpedoes and mines, 3517–20, *pictures,* 2427; war vessels of Middle Ages, 3208; in World War, 2422–4, 3796, 3376–8, 3517–20, 2428, *pictures,* 2427, 3792. *See also in Index* **United States Navy.**
**Navy Department,** U.S., 3597, 3599; building, 3684; Marine Corps, 2149; Naval Observatory, 2551, 3684; secretary, 555.
**Naxos** (*năk'sŏs*), Gk. Aegean isl., largest of Cyclades; 163 sq. mi.; pop. 20,000; famous wine; associated with Dionysus; ravaged by Persians 490 B.C.; seat of Venetian dukes 1207; captured by Turks 1566; 1528, *map,* 1518; emery, 1142.
**Nayarit** (*nä-yä-rēt'*), Mexico. State on cent.-w. coast; until 1917 territory of Tepic; 10,953 sq. mi.; pop. 176,000; cap. Tepic.
**Nazareth** (*năz'ä-rĕth*), Palestine, town 65 mi. n. of Jerusalem; pop. 10,000; much visited by Pilgrims; great Church of the Annunciation; boyhood home of Jesus, 1888, 2644–5, *picture,* 2646.
**Nazimova** (*nä-zē'mō-vä*), **Alla** (Mrs. Charles Bryant) (born 1879), Amer. emotional actress, especially of Ibsen plays; b. Russia, made N.Y. début in 1905 (Nora in 'A Doll's House'; 'Hedda Gabler'); 1892.
**Neagh, Lough** (*lŏĸ nā*), lake in n.e. Ireland, near Belfast, 1807, *map,* 1159.
**Neanderthal** (*nā-ăn'dĕr-tăl*) **race** of Stone Age man, 2133.
**Neapolis** (*nē-ăp'ō-lĭs*), anc. Gk. settlement on site of Naples, 2390.
**Neap** (*nēp*) **tide,** 3497.
**Near East.** Name applied to e. portion of Asia comprising Persia, Arabia, Asia Minor, and Syria; often includes Turkish possessions in Europe.
**Near-sightedness,** 1214; corrected by concave lenses, 3310.
**Neat cattle,** defined, 663.
**Neb-neb,** an African acacia, 4.
**Ne'bo.** A mt. in Palestine whence Moses saw the Promised Land; perhaps the modern Jebel Neba (2650 ft.) near n. end of Dead Sea.
**Nebras'ka,** a n.-cent. state of U.S.; 77,520 sq. mi.; pop. 1,296,372; cap. Lincoln; 2429–32, *maps,* 2429, 3584–5; agriculture, 2430; cities and mfrs., 2432, 2581; climate, 2430; dunes, 3121, 2429; fossils, 1336; history, 2432, 1913, 1027; irrigation, 1829, 2429–30; live stock industry, 2430; meaning of name, 2432; potash, 2430, 2900; state flower, 3347; surface features, 2429.
**Nebraska, University of,** at Lincoln, Neb.; co-ed.; state control; founded 1869, opened 1871; arts and science, agriculture, domestic science, law, medicine, fine arts, music, pedagogy, engineering; 2432, *picture,* 2431.
**Nebraska City,** in rich agricultural region of s.e. Neb. on Missouri R.; pop. 6279; grain elevators, canneries, flour mills; early fur post, 2432.
**Nebraska Wesleyan University.** At University Place, near Lincoln, Neb.; co-ed., Meth.; organized 1887; liberal arts, music, education.
**Nebuchadnezzar** (*nĕb-ū-kăd-nĕz'ēr*) or **Nebuchadrezzar,** Babylonian king 604–561 B.C.; restores Babylon, 298, 625; captures Jerusalem, 1891; favors Daniel, 2922; Hanging Gardens, 3177–8, *picture,* 3179.
**Nebulae** (*nĕb'yu-lē*), in astronomy, 2432–3, 240; of Orion, 2432, *chart,* 3343.
**Neb'ular hypoth'esis,** theory that solar system condensed from a nebula, 2433, 2818–9.
**Nebu'lium,** a substance found in nebulae, 2432.
**Neches** (*nĕch'ĕz*) **River,** in Tex., rises in n.e. and flows 350 mi. s. to Sabine L., 3476.
**Necho** (*nē'kō*) **II** (d. 594? B.C.), king of Egypt, 1656; Africa circumnavigated, 36.
**Neck'ar River,** Germany, tributary of Rhine rising in Black Mts., entering main stream at Mannheim, 433, 1628.
**Neck'er, Jacques** (1732–1804), Fr. financier; father of Mme. de Staël; director-general of Fr. finances, 1367, 2148.
**Nec'romancer,** 2120.
**Nec'tarine,** a fruit, 2699.
**Nedjed** (*nĕd'jĕd*) or **Nejd.** Desert region in cent. Arabia; Emir expelled Turks from El Hasa 1913; recognized 1915 as independent ruler of Nedjed and El Hasa by Gt. Brit.
**Needle,** 2433–4; of Stone Age, *picture,* 3361.
**Needle, phonograph,** 2776.
**Needle-gun,** 1254, *picture,* 1253.
**Needlepoint lace,** 1949.
**Neerwinden** (*nār'vĭn-dĕn*), Belgium. Village 30 mi. e. of Brussels where French defeated English 1693, and Austrians defeated French 1793; occupied by Germans 1914.
**Neeshima, Joseph Hardy,** Japanese Christian educational leader educated in U.S.; founds Doshisha Univ., 1946.
**Negapatam** (*nĕg-ä-pä-tăm'*), port of s.e. India; pop. 60,000; brisk trade with Ceylon and E. Indies; point for coolie emigration; vegetable oils; exports rice, 1746.
**Neg'ative, photographic,** 2780–1.
**Negative electricity,** 1110.
**Negri Sembilan** (*nā'grē sĕm-bē-läń'*), one of Federated Malay States, bordering Strait of Malacca; composed of 9 lesser states; 2550 sq. mi.; pop. 130,000; largely agricultural; exports tin; 2130.
**Negrito** (*nĕ-grē'tō*), racial type resembling negro, 2434; in Philippines, 2765; in Andaman and Nicobar Isls., 1756.
**Ne'gro,** 2434–5; in Africa, 37, 3280, *pictures,* 35, 3283; in Barbados, 329; Brazil, 495, 3288; Guiana, 1547; Haiti, 1560–1; Liberia, 1990–1; numbers, 2881, 2434, 37. —*In U.S.,* 2434–5; education, 2434–5, 3674, 3685, 1610; Lemmon case, 222; during Reconstruction, 780; slavery, 3249; suffrage, 780, 3385. *See also in Index* **Slavery.**
**Ne'groids,** 2434.
**Negro River.** *See in Index* **Rio Negro.**
**Negros** (*nā'grōs*). Fourth largest isl. of Philippines, near center of group; 4903 sq. mi.
**Ne'gus Ne'gusti,** title of Abyssinian emperor, 3.
**Nehemiah** (*nē-hĕ-mī'ä*) (5th cent. B.C.), gov. of Judea under Artaxerxes; restored walls of Jerusalem, relieved condition of poor, and reëstablished temple service; 1891.
**Nehemiah, Book of.** Book of the Old Testament largely written by Nehemiah; recounts the events of his rule.
**Nejd.** Same as **Nedjed.**
**Nell, Little.** Sweet unselfish child-heroine of Dickens' 'Old Curiosity Shop', who dies from weariness and privation.
**Nelson, Admiral Horatio** (1758–1805), Eng. naval commander, 2435–6; battle of Copenhagen, 880, 2435; commemorated in sailors' uniforms, 2426; monument, *picture,* 2052; tomb in St. Paul's, 2052; Trafalgar, 2435–6, 2427–8, 2394.
**Nelson,** British Columbia. City in s.e. on arm of Kootenay L.; pop. 5500; commercial center of the mining, lumbering, and fruit-growing Kootenay dist.
**Nelson River,** Canada, name given to lower course of Saskatchewan in Manitoba; flows 400 mi. n.e. from L. Winnipeg to Hudson Bay; 3129, 604, *map,* 602–3.
**Neme'an lion,** in Gk. myth., monster slain by Hercules, 1640.
**Nem'esis,** in Gk. myth., goddess of justice, 2436.
**Ne'mo, Captain,** character in novel by Jules Verne, 3375, 3376.
**Neodym'ium,** a metallic element, 4042.
**Neolith'ic** or **New Stone Age,** 3361, 2133; camp, *picture,* 667.
**Ne'on,** a gaseous element, 4042; in air, 50.
**Neo'sho River,** in Kansas and Oklahoma; 350 mi. to the Arkansas; *map,* 1910.
**Nepal** (*nē-pąl'*), kingdom between n.e. India and Tibet, on s. side of Himalayas; 54,000 sq. mi.; pop. 5,600,000; cap. Khatmandu; under Brit. influence; 1744, *maps,* 232–3, 1744; Mt. Everest, 1207–8, *picture,* 227.
**Nepos** (*nē'pŏs*), **Cornelius** (99?–24 B.C.). Rom. historian ('De viris illustribus', much used as school text).
**Nep'tune,** in Rom. myth., sea-god corresponding to Gk. Poseidon, 2436, 2891. *See also in Index* **Poseidon.**
**Neptune,** planet, 2436, 2816, *chart,* 2816; discovery, 244–7, 2818; distance from sun, 242, *picture,* 241; orbit, 2815; pull of sun, 3394; satellite, 2818.
**Nereids** (*nē'rē-ĭdz*), in Gk. myth., 50 sea-nymphs, 2546; Calypso, 2563; attend Poseidon, 2891.

**Nereus** (*nē'rụs*). In Gk. myth., a minor sea-god, father of the Nereids; sometimes called "the old man of the sea"; he guided Hercules to the Garden of the Hesperides after changing his form in turn to fire, lion, water, and smoke in effort to escape from Hercules.

**Ne'ro** (37–68 A.D.), Rom. emperor, **2436, 3047, 3050, 3066;** poisons guests with mushrooms, **2374;** statues at Delphi, **991.**

**Ner'va** (32–98 A.D.), Rom. emperor, kindly but feeble; adopted Trajan as colleague and successor; **3047.**

**Nerve-blocking,** a mode of producing anesthesia, **125.**

**Nerves, 2436–7;** auditory, **1057;** and brain, **486–92;** control digestion, **1011;** evolution of nervous system, **486;** gray and white matter, **490,** *picture,* **491;** of heart, **1617;** in hypnosis, **1718;** in muscle fiber, *picture,* **2373;** optic, **1213,** *pictures,* **1213, 1214, 1216;** poisons act on, **2855;** shape of cell, **672;** of smell, **3252;** in teeth, **3452,** *picture,* **3453;** of touch, **3520–1.**

**Ness, Loch,** lake in Scotland; 23 mi. long, average width one mile; discharges into Moray Firth by R. Ness, 8 mi. long; **3146,** *map,* **1152–3.**

**Nes'sus,** in Gk. and Rom. myth., centaur slain by Hercules, **1641.**

**Nes'tor,** in the 'Iliad', wise old warrior and counselor of Greeks in the Trojan War, **3542–3.** The "Nestor" of an organization or group means the oldest member.

**Nesto'rians.** Christian sect named after Nestorius (d. about 440), patriarch of Constantinople; centered in Persia; "catholicus" or chief bishop had seat at Bagdad from 762 to 1258; in 6th and 7th centuries spread over much of Asia, evangelising India and China; adherents now number about 150,000 in Turkey and Persia.

**Nests,** of alligator, **98;** ants, **141,** *picture,* **140;** birds, **405–6, 3710,** *pictures,* **404, 407, 408;** fish, **1275, 3357, 3396;** of insects, **1786;** termite, *picture,* **143;** wasps and hornets, **3690–3,** *pictures,* **3691.**

**Neth'erlands, Kingdom of** (Holland), in n.w. Europe; 13,000 sq. mi.; pop. 6,800,000; cap. The Hague; **2438–43,** *maps,* **373, 1196–7;** agriculture, **2440, 2441, 2900;** chief cities and manufactures, **2440–1, 119, 1558, 3068, 3612;** Delft pottery, **2906;** diking, **2438, 1827,** *pictures,* **2442, 1191;** foreign trade, **2438, 3068, 1072, 1879;** government, **2442, 1179;** painting, **2630–1, 2637;** physical features, **2438, 1191–2, 1193;** rivers and canals, **2438, 2207, 3005, 3136;** shipping tonnage, **3219;** tulip-growing, **3547, 2440, 2441.**

*History,* **2441–3;** under Charles the Bold, **697;** Renaissance, **2996, 2997;** struggle for independence, **2442, 3612, 3741;** independence acknowledged, **3489, 520,** (story) **2443;** early spice trade, **3317;** naval power in 17th cent., **2427;** Pilgrims in, **2176;** wars with England, **2442, 435, 694, 2427, 3003;** Amer. colonies, **2496–7, 867, 989, 2461;** wars with Louis XIV, **2065–6, 3740–1;** Louis Bonaparte king, **451;** loses colonies in S. Africa, **3279–80;** union with Belgium, **376, 1193, 520;** Scheldt River controversy, **3136.**

**Nethersole, Olga** (born 1870). Eng. emotional actress (Sapho, Carmen, The Second Mrs. Tanqueray, Sister Beatrice).

**Néthou** (*nā-tụ'*), **Pic,** highest mt. of the Pyrenees, **2940.**

**Nets, fish, 1284, 1285,** *pictures,* **1282, 1283, 1285.**

**Netsukes** (*nā'tsụ-kāz*), Japanese carvings, **1874.**

**Netted** or **nutmeg melon, 2196.**

**Nettle,** an herb with hairs which exude a stinging juice when broken, **2443, 3712;** horse nettle really a nightshade, **2509.**

**Nettle family,** or *Urticaceae,* family of herbs and vines with hairy stems and primitive flowers, **3940;** includes nettles, **2443,** hops, **1680.**

**Net tonnage, 3220.**

**Neuchâtel** (*nû-shä-tĕl'*), r.r. and industrial center in w. Switzerland on L. Neuchâtel; pop. 23,000; univ.; manufactures, **3416.**

**Neuchâtel,** lake in w. Switzerland, 18 mi. n. of L. Geneva; 93 sq. mi.; traversed by R. Thièle; **3414.**

**Neuilly** (*nû-yē'*) or **Neuilly-sur-Seine,** France, mfg. and residential town and n.w. suburb of Paris on Seine R.; pop. 46,000; **2685.**

**Neuilly, treaty of** (1919), **1662.**

**Neu-Kölln** (*noi-kûln*), Germany. A suburb of Berlin; pop. 267,000.

**Neurop'tera,** an order of net-veined insects, such as ant-lions, **1788.**

**Neuse** (*nūs*), a river of N. Carolina, 300 mi. long, *map,* **2518.**

**Neutral'ity,** in international law, **1794;** blockade regulations, **437;** embargo acts, **1140;** in War of 1812, **3670, 3671;** Washington's policy, **3678;** in World War, **3790, 3799, 3746–7.**

**Neuve-Chapelle** (*nûv-shä-pĕl'*), Fr. village 25 mi. s. of Ypres; World War battle, **3810, 3792.**

**Ne'va River,** in n.w. Russia; flows 40 mi. from L. Ladoga to Gulf of Finland 10 mi. below Petrograd; connected by canal with Volga system; **1955, 2747, 2749.**

**Nevada** (*nĕ-vă'dȧ*), state in w. U.S.; 110,690 sq. mi.; pop. 77,407; cap. Carson City; **2444–8,** *maps,* **2445, 3584–5;** history, **2446, 3240, 3242;** irrigation, **2444,** *picture,* **1829;** meaning of name and nickname, **2444, 3104;** physical features, **2444, 3580;** silver, **3240, 3242, 3243;** state flower, **3347;** story, 'The Dream of Chief Winnemucka', **2447–8.**

**Nevada, University of,** at Reno, Nev.; co-ed., state control; founded 1873 (at Elko), opened at Reno 1886; arts and science, engineering, domestic science, agriculture, state normal school; Mackay School of Mines, *picture,* **2446.**

**Nevers** (*nē-vĕr'*), France. Mfg. town 140 mi. s.e. of Paris; pop. 28,000; fine cathedral.

**Neville** (*nĕv'il*). Great Eng. family; the most famous member was Warwick, "the Kingmaker" (Richard Neville). *See in Index* **Warwick.**

**Nevin** (*nĕv'ĭn*), **Ethelbert** (1862–1901). Amer. composer; immensely popular for the sentimental sweetness of his works ('Narcissus'; 'The Rosary').

**Nev'is,** isl. of British W. Indies, one of Leeward Isls.; 50 sq. mi.; birthplace of Alexander Hamilton, **1568.**

**Nevsky Prospekt,** famous avenue in Petrograd, **2748.**

**New Albany,** Ind. Industrial and trade city nearly opposite Louisville, Ky., on Ohio R.; pop. 22,992; extensive water-power; cotton, flour, iron products, engines, furniture; national cemetery.

**New Amsterdam,** name of New York City under Dutch rule, **2496–7, 3374–5, 694.**

**Newark** (*nū'ȧrk*) or **Newark-on-Trent,** England, old town 65 mi. s.e. of Manchester; pop. 17,000; once fortress of great strength and called "key to North"; here Charles I was besieged 1646 by Scotch, to whom he finally surrendered; gave name to Newark, N.J., **2448.**

**Newark,** N.J., largest city of state; pop. 414,524; **2448;** buttons, **550;** hats, **1597;** paintings by Kenyon Cox, **911.**

**Newark,** Ohio, industrial city 30 mi. e. of Columbus, on Licking R.; pop. 26,718; one of largest stove factories in world; r.r. repair shops; makes glassware, chemicals, farm implements, electric cars; Buckeye L.; Indian mounds, **2357.**

**New Bahama Channel.** *See in Index* **Florida Straits.**

**New Bedford,** Mass., mfg. city on Buzzards Bay; pop. 121,217; **2448–9.**

**New Bern,** N.C. Port on Neuse R., near its mouth; pop. 12,198; exports fish, cotton, lumber, and vegetables; lumber and grist mills, fertilizer works; captured by Gen. Burnside 1862.

**Newberry, John** (1713–67), Eng. publisher, associated with Dr. Johnson and Goldsmith, **2053, 2340.**

**New Britain,** largest isl. in Bismarck Archipelago; 10,000 sq. mi.; pop. 50,000; formerly called New Pomerania; **2620,** *map,* **264–5.**

**New Britain,** Conn. Mfg. city in s.-center 9 mi. s.w. of Hartford; pop. 59,316; chief products, hardware and cutlery.

**New Brunswick,** a maritime province of Canada; 27,985 sq. mi.; pop. 352,000; **2449,** *map,* **602–3;** chief city, St. John, **3107,** *picture.* **609;** joins Confederation, **618;** industries, **2449;** logging, *picture,* **606;** Maine boundary dispute, **2129;** United Empire Loyalists, **617.**

**New Brunswick,** N.J. Mfg. and trade city on Raritan R. 27 mi. s.w. of New York City; pop. 32,779; surgical and medical supplies, wall paper, rubber tires, metal goods; Rutgers College; occupied by British 1776–77.

**New Brunswick, University of.** At Fredericton, New Brunswick; co-ed., non-sect.; founded 1800 (college of New Brunswick, reorganized as univ. 1859); arts and science, civil engineering, electrical engineering, forestry, law.

**Newburgh,** N.Y. City on Hudson R. 55 mi. above New York City; pop. 30,366; important trading and shipping point before Revolution; Hasbrouck Mansion was Washington's headquarters; trade center for coal, farm products; various large mfrs.

**Newburyport,** Mass., city on Merrimack R. 3 mi. from sea and 30 mi. n.e. of Boston; pop. 15,618; coal trade; makes boots and shoes, cotton, hats, iron; settled about 1635; famous for shipbuilding in days of wooden sailing vessels; many historic landmarks; birthplace of William L. Garrison, **1400.**

**New Caledonia,** Fr. isl. 850 mi. e. of Queensland, Australia; 7650 sq. mi.; pop. 51,000; **2620, 1356,** *map,* **264–5;** chrome iron ore, **1976;** nickel, **2507,** *picture,* **2506.**

**New Castile,** the s. part of Castile, including the old Moorish kingdom of Toledo; chief cities are Madrid, Toledo, Ciudad Real; fertile river valleys, sterile elevated plateaus; *map,* **3300.**

**New Castle,** Del., city on Delaware R. 5 mi. s. of Wilmington; pop. 3854; settled by Swedes 1640; landing place of William Penn 1682; **987.**

**Newcastle,** Ind. Industrial town on Blue R. 45 mi. n.e. of Indianapolis; pop. 14,458; makes auto parts, kitchen cabinets, pianos; farm trade; roses and shrubbery; state village for epileptics 2 mi. n.

**Newcastle,** city in New S. Wales, Australia, 100 mi. n. of Sydney; pop. 63,000 with suburbs; great coaling port; ships wood, mutton; **2471.**

**Newcastle,** Pa. City 42 mi. n.w. of Pittsburgh; pop. 44,938; on Shenango and Neshango rivers; rich mining and farming region; iron, steel, and tin products, pottery.

**Newcastle-under-Lyme,** England. Town 30 mi. s. of Manchester; pop. 20,000; famous potteries.

**Newcastle-upon-Tyne,** great coal-shipping center of England, on Tyne R.; pop. 287,000; **2449.**
**Newchwange** (*nū-chwäng'*) or **Niuchwang.** Treaty port in s. Manchuria, 300 mi. n.e. of Peking; pop. 50,000; taken by Russians 1900 and by Japanese 1904.
**New College,** Oxford, founded, **2610.**
**Newcomb, Simon** (1835–1909). Amer. astronomer, mathematician, and textbook writer; director of U.S. Nautical Almanac (1877–97).
**Newcome, Colonel,** in Thackeray's 'The Newcomes', a gallant, simple-hearted, unworldly gentleman; story retold, **3480–1.**
**Newcomen, Thomas** (1663–1729), Eng. mechanic; first practical steam pumping engine, **3348,** *picture,* **3705.**
**Newell, Peter** (born 1862). Amer. writer and illustrator of humorous books, especially for children; wrote 'Topsys and Turveys'; 'Peter Newell's Pictures and Rhymes'; 'The Hole Book'; 'The Rocket Book'.
**New England,** collective name for states of Me., N.H., Vt., Mass., Conn., and R.I.; *Study Outline,* **3877–8;** fisheries, **1282, 1283–5;** granite, **1497;** in Ice Age, **1720;** mountains, **158, 2453;** origin of name, **3253;** story, 'Life in a Maple Sugar Camp', **2138–42;** town govt., **3521, 3008–9, 906;** trade with Far East, **233, 2927;** typical village, *picture,* **2168;** water-power, **3584.** —*History:* settled by Pilgrims, **2175–8;** New England Confederation, **3592, 3757, 3602;** emigration, **3581, 3582, 1762, 2227, 2567;** opposes Embargo Acts, **1883;** opposes War of 1812, **3672–3;** abolition movement, **1401, 3736;** spirit reflected in literature, **113, 114.** *See also* separate states and chief cities by name.
**New England Confederation, 3592, 3757, 3602.**
**New England Primer.** One of the most famous schoolbooks in history of education; first printed about 1688; most familiar quotation from it is child's prayer, "Now I lay me down to sleep."
**New Forest,** wooded region in s.w. Hampshire, England, used as public pleasure ground, **3740.**
**Newfoundland** (*nū'fünd-länd*), isl. in Gulf of St. Lawrence; 42,734 sq. mi.; pop. 261,000; **2450,** *maps,* **602–3, 616;** discovered, **561, 616;** fogs, **1316;** Labrador, **1948;** potatoes, **2902.**
**Newfoundland Banks** or **Grand Bank,** submarine plateau off coast of Newfoundland, famous fishing grounds, **2450, 1283;** fogs, **1316.**
**Newfoundland dog, 1023.**
**New France,** name for Canada under Fr. rule, **2947.** For history *see in Index* **Canada.**
**Newgate.** Prison in London, built about 1200, several times remodeled, and demolished 1902; notorious for wretched moral and sanitary conditions due to crowding and mingling of all kinds of prisoners.
**New Glasgow,** Nova Scotia. Coal and iron-mining town on East R. 80 mi. n.e. of Halifax; pop. 9000; iron, steel, and lumber products, ships.
**New Granada,** original Span. name for Colombia, **836.**
**New Guinea,** largest isl. of Malay Archipelago; 300,000 sq. mi.; pop. 1,000,000; **2451–3,** *maps,* **1073, 232–3, 264–5.**
**New Hampshire,** New England state of U.S.; 9341 sq. mi.; pop. 443,083; cap. Concord; **2453–6,** *maps,* **2454, 3584–5;** chief cities, **2454, 2456;** industries, **2454, 2456;** history, **2456, 3630, 3632;** minerals, **1497, 2219;** origin of name, **3347;** physical features, **2453–4;** state flower, **3347.**
**New Hampshire College of Agriculture and Mechanic Arts.** State institution at Durham, N.H.; co-ed.; opened 1867; agriculture, engineering, science, education.
**"New Hampshire Grants," 3630.**
**New Harmony,** Ind., town 22 mi. n.w. of Evansville on Wabash R.; pop. 1126; settled 1815 by Ger. Harmonists; property sold 1824 to Robert Owen for socialistic community; **3268, 879.**
**New Haven,** Conn., chief city of state, seat of Yale Univ.; pop. 162,519; **2456;** early history, **867, 868, 3592;** East Rock, *picture,* **866;** Yale Univ., *pictures,* **830, 868.**
**Newhaven,** England. Seaport on Eng. Channel at mouth of Ouse R. 50 mi. s. of London; terminus of steamer line to Dieppe, France.
**New Hebrides,** group of isls. e. of n. Australia; 5100 sq. mi.; pop. 70,000; export coffee, copra, cotton; **2620,** *map,* **264–5.**
**'New Héloïse, The',** novel by Rousseau, **3071.**
**New Holland.** Former name of Australia.
**New Ireland,** 2d largest isl. of Bismarck Archipelago; Australian mandatary; 4600 sq. mi.; formerly New Mecklenburg; **2620,** *map,* **1073.**
**New Jersey,** a cent. Atlantic state of U.S.; 8224 sq. mi.; pop. 3,155,900; cap. Trenton; **2457–61,** *maps,* **2458, 3584–5;** chief cities and mfrs., **2458, 2448, 254, 1884–5, 2694, 3540;** dunes, **3121;** early history, **2461, 1664;** origin of name, **3347;** state flower, **3347;** Wilson's administration, **3744.**
**New Jersey Plan, 2461.**
**New Jerusalem Church.** *See in Index* **Swedenborg.**
**New Kensington,** Pa. Industrial borough 15 mi. n.e. of Pittsburgh on Allegheny R.; pop. 11,987; large aluminum, steel and iron, and plate glass industries.
**New Lanark,** village in Scotland, 25 mi. s.e. of Glasgow; Robert Owen's community, **3268.**
**New London,** Conn. Port and summer resort on Thames R. 40 mi. e. of New Haven; pop. 25,688; machinery, iron, silk, brass and copper ware, etc.; founded 1646; burned by British under Benedict Arnold 1781; Harvard-Yale crew races each June.
**New Madrid,** Mo., city in s.e. on Mississippi R. 50 mi. s. of Cairo, Ill.; pop. 1908; agricultural and lumber interests; earthquake (1812), **2272, 1065–6.**
**Newman, Cardinal John Henry** (1801–90), Eng. churchman, **2462.**
**Newmarket,** England. Town 14 mi. n.e. of Cambridge; pop. 10,500; famous for horse races.
**New Mecklenburg.** *See in Index* **New Ireland.**
**New Mexico,** state of s.w. U.S.; 122,634 sq. mi.; pop. 360,350; cap. Santa Fe; **2462–7,** *maps,* **2465, 3584–5;** alfalfa, **2465;** chief cities, **2466–7;** cliff dwellers, **793–4;** climate, **2464–5;** fossils, **1683;** history, **2466–7, 2208, 855–6;** Indians, **2467, 1767, 2933,** *picture,* **2463;** irrigation and reclamation, **2465–6, 1829, 3022;** minerals, **2466, 1139;** origin of name, **3347;** physical features, **2462, 2464;** state flower, **3347;** stock-raising, **2465;** timber, **2466, 1139.**
**New Mexico, University of.** At Albuquerque, N.M.; co-ed., state control; established 1889, opened 1892; arts and science, engineering, normal work, commerce, music, school of Latin-American affairs.
**New Mexico College of Agriculture and Mechanic Arts.** Near Las Cruces, N.M.; co-ed., state control; founded 1889; agriculture, home economics, general science, civil, electrical, irrigation and mechanical engineering.
**New Mexico Normal University.** At Las Vegas, N.M.; chartered 1893, opened 1898; reorganized 1899 as State Teachers' College; co-ed.
**New moon, 2318.**
**New Netherlands,** Dutch colony established in America 1614; afterward New York, **2486, 3602.**
**"New occasions teach new duties," 2074.**
**New Orleans,** La., port on Mississippi R. 107 mi. above its mouth; pop. 387,219; **2468–71, 2068;** Mardi Gras procession, *picture,* **2071;** tobacco mfrs., **3510;** Tulane Univ., *picture,* **2069.** —*History,* **2471;** early importance, **2072, 2268;** ceded to Spain by France, **2072, 1362;** passes to U.S., **2073;** battle in War of 1812, **3672, 1856;** siege in Civil War, **1225, 2884.**
**New Philadelphia,** Ohio. Mfg. city with coal-mining interests on Tuscarawas R. and Ohio Canal about 70 mi. s. of Cleveland; pop. 10,718; chief mfrs. enamel goods and steel products; ships live stock and Swiss cheese.
**New Plymouth,** New Zealand. Seaport and r.r. terminus on w. coast of North Isl.; pop. 11,000; flour mills, leather mfrs.; trade in dairy products.
**New Pomerania.** *See in Indcx* **New Britain.**
**Newport,** England. Port in s.w. on Usk R. 4 mi. from Bristol Channel; pop. 91,000; coal, iron, cattle trade; iron products.
**Newport,** Ky. Residential city on Ohio and Licking rivers, opposite Cincinnati, Ohio; pop. 29,317; sheet iron, carriages, watch-cases, wire screens; Ft. Thomas, U.S. military post, 3 mi. s.
**Newport,** R.I., fashionable resort on s.w. coast of isl. of Rhode Island; pop. 30,255; many beautiful estates; much historic interest; founded in 1639; **3010.**
**Newport News,** Va., seaport and shipbuilding center on James R. at entrance into Hampton Roads; pop. 35,596; large foreign trade (grain and coal); lumber, knitted goods, iron; **3650.**
**New River,** headstream of Kanawha; rises in Blue Ridge Mts. of N.C., flows across w. corner of Va. and joins Gauley R. in Fayette County, W. Va.; **3648,** *picture,* **3720.**
**New Rochelle,** N.Y. Residential suburb and summer resort n. of New York City; pop. 36,213; speedometers, scales, powder-puffs, etc.; settled 1687 by Huguenots from La Rochelle, France.
**New Salem,** Ill., home of Abraham Lincoln, **1731, 2012.**
**New Siberia,** group of isls. in Arctic Ocean n. of Siberia; largest Kotelnoi (116 mi. by 100 mi.); uninhabited except for hunters; *maps,* **189, 232–3.**
**New South Wales,** Australia, state in s.e.; 309,432 sq. mi.; pop. 2,000,000; **2471,** *maps,* **264–5;** cap. Sydney, **3424;** founded, **267;** r.r. gauge, **265.**
**Newspapers, 2472–5;** engraving processes, **1170–2;** freedom of the press, **2918, 2497;** historical development, **2475, 1165, 986;** linotype, **2019–23;** paper, **2666–73;** printing, **2916, 2917;** in S. Amer., **526, 836;** stereotyping, **3355.**
**New stars** or *novae,* **3343, 3341.**
**New Sweden,** Swedish colony in U.S. on Delaware R. 15 mi. s.w. of Philadelphia, Pa.; founded 1638; **989.**
**Newt,** a long-tailed amphibian animal, **3113;** evolutionary position, **2997;** foot, *picture,* **1323.**
**New Testament, 388, 390;** Epistles of Paul, **2698;** Epistles of Peter, **2745;** Gospels, **1887, 1888, 157, 2745.**
**Newton, Sir Isaac** (1642–1727), Eng. physicist and mathematician, **2476–8,** *picture,* **1507;** astronomical contributions, **239–40;** determines

compound character of color, **3311**; and gravity, **1506–8, 2816**; invents reflecting telescope, **3462**; laws of motion, **2190**; measures speed of sound, **1074**; modesty of, **1697**; philosophy spread by Voltaire, **3661**; theory of light, **1998**.

**Newton, John** (1725–1807), Eng. clergyman and poet; collaborates with Cowper, **911**.

**Newton,** Mass., suburb of Boston, on Charles R.; pop. 46,054; **472**.

**Newtown.** Former name of Elmira, N.Y., scene of battle (1779) in which Americans under Sullivan defeated Tories and Indians under Sir John Johnson and Joseph Brant.

**New Westminster,** British Columbia. Port on Fraser R. 12 mi. s.e. of Vancouver; pop. 17,000; lumbering, fishing, canning.

**New Year's Day, 2478–9.**

**New York,** a middle Atlantic state of U.S., 47,654 sq. mi.; pop. 10,384,829; cap. Albany; **2479–86,** *maps,* **2480, 3584–5**; Adirondack Mts., **25**; agriculture, **2485–6, 2061, 161, 1502**; chief cities, **80, 515, 527–8, 2487–98, 3033, 3425, 3545**; commerce and transportation, **2484–5, 2496, 627, 527**; dairy industry, **2485, 2486, 952, 953, 709**; education, **1084, 1086**; foreign population, **2486, 2495, 3545**; Hudson R., **1692**; influence of geography, **2480, 2482, 2484**; Long Island, **2061**; manufactures, **2485, 1475, 549** (*see also* under chief cities); minerals, **3115, 3425, 676**; Niagara Falls, **2501–4**; origin of name, **3347**; physical features, **2480, 2482, 2484, 1721**; state flower, **3347**; West Point, **2236–8.** —*History,* **2486, 1664**; Hudson's voyage, **1690**; Dutch settlement, **2496–7, 3374–5, 80**; England acquires, **694, 2497, 1547**; postal service established, **2896**; Albany congress, **80, 3592**; in Rev. War, **3002, 3003, 3126, 2061, 2238**; Vermont dispute, **3630, 3632**; Erie Canal opened (1825), **627, 2484**; Tammany influence, **3432**; Lemmon slave case, **222**; Cleveland governor, **790**; Roosevelt governor, **3060**; Hughes governor, **1693**.

**New York, College of the City of,** a free college for men, **2495**.

**New York City,** N.Y., 2d largest city of world; pop. 5,620,048; **2487–98, 2479–80,** *map,* **2488**; American Museum of Natural History, **1336, 3443, 2494**; bridges, **505–6, 2495,** *pictures,* **508, 2490**; Brooklyn, **515**; Coney Isl., **857**; foreign population, **2495**; government, **2498**; Hall of Fame, **1566**; harbor and islands, **2487–8, 1692**; Hudson R., **1692**; manufactures, **2496**; r.r. stations, **2966, 2496, 2970**; Stock Exchange, **3359–60, 2496**; subways and tunnels, **2495, 3552,** *pictures,* **3550, 3551, 2498**; Tammany Hall, **3432, 2498**; transportation system, **2495–6, 3552, 2966**; water supply, **164, 3701, 3702, 3703,** *pictures,* **2486, 3701, 3702**; Woolworth Building, **2489,** *picture,* **3216.** —*History,* **2496–8**; under Dutch rule, **3374–5**; Stamp Act Congress, **3337**; great fire of 1776, *picture,* **3603**; draft riots, **779, 2498**; Roosevelt reforms police, **3059**.

**New York 'Herald',** sends Stanley to Africa, **3338**.

**New York Park,** at Niagara Falls, **2504**.

**New York Public Library, 2491.**

**New York State Barge Canal, 627, 2484–5,** *maps,* **1511, 2480.**

**New York State College for Teachers.** At Albany, N.Y.; co-ed.; founded 1844; arts and science.

**New York University,** at New York, N.Y.; co-ed.; established 1830; arts and science, law, medicine, pedagogy, veterinary surgery, commerce; **2495**; Hall of Fame, **1566**.

**New Zealand, Dominion of,** Brit. dominion comprising a group of isls. in S. Pacific Ocean; 103,581 sq. mi.; pop. 1,242,000; cap. Wellington; **2499–2500,** *maps,* **2624–5, 264–5**; cabinet government, **2500, 555**; Cook's explorations, **872, 874, 513**; German colonies captured in World War, **3796**; mandates, **513, 2500**; population, *map,* **264–5**; rainfall, *map,* **264–5**; resins, **2997**; surface, **2499,** *map,* **264–5**; vegetation, **2499,** *map,* **264–5**; whaling stations, *pictures,* **3725, 3726**; woman suffrage, **3779**.

**Nexö, Martin Andersen** (born 1869), Danish novelist, **3134**.

**Ney** (*nā*), **Michel** (1769–1815), Fr. marshal, **2500–1, 3699**.

**Nez Percés** ("pierced noses") (*nā pĕr-sā'*), tribe of Plains Indians, who formerly roamed from e. Oregon and Washington to Bitter Root Mts. and s. to Snake R., **1767**.

**Ngami** (*ŋg̃ä'mē*). Lake in Rhodesia, Africa; remnant of former great inland sea, now marshland.

**'Niag'ara',** Amer. warship, **2730**.

**Niagara, Fort.** *See in Index* **Fort Niagara.**

**Niagara Escarpment,** *picture-map,* **2503**.

**Niagara Falls,** 2d greatest falls in world, **2501–4**; harnessing its power, **3694, 3554,** *pictures,* **3695, 2482**; power canal, **1514,** *picture-map,* **2503**; Welland Canal, **3716, 1514**; Whirlpool, **3733, 2502**.

**Niagara Falls,** N.Y., resort and industrial city on Niagara R., 20 mi. n.w. of Buffalo; pop. 50,760; enormous water-power; electro-chemical works; cereals, abrasives, silver plate, flour, paper; Niagara Univ.; **2504**; aluminum industry, **105**; calcium carbide, **8**; graphite, **1502**; mills, *picture,* **2482**.

**Niagara Falls,** Ontario, r.r. city opposite Niagara Falls, N.Y.; pop. 13,000; enormous hydro-electric plants; cereals, iron products, carborundum, hats, silverware; **2504**.

**Niagara Gorge, 2502.**

**Niagara River,** outlet of L. Erie flowing n. to L. Ontario, 33 mi., **2501–4, 2583, 3716**.

**Niagara University.** At Niagara Falls, N.Y.; men; Cath.; founded 1856; arts, sciences, philosophy.

**Nian'tic** or **Nehan'tic.** An Algonquian tribe of Amer. Indians who occupied coast of R.I. from Narragansett Bay to Conn.; absorbed by Narragansetts after destruction of Indian power in Pequot War of 1637.

**Nib,** of cacao bean, **756**.

**'Nibelungs** (*nē'bē-lŋgs*), **Song of the',** or **'Nibelungenlied',** Ger. epic of 13th cent., **2504, 1436**; Siegfried legend, **3231**; Wagner's operas, **3663**.

**Nib'lick,** a golf club, *pictures,* **1486, 1485**.

**Nicaea** (*nī-sē'ȧ*) or **Nice** (modern Isnik), important anc. city of Bithynia, Asia Minor, on L. Ascania 60 mi. s.e. of Constantinople; declined under Turkish rule (14th cent.); famous church council (325 A.D.), **870, 763, 1070**.

**Nicaragua** (*nĭk-ȧ-rä'g̃wȧ*), largest of Cent. Amer. republics; 49,200 sq. mi.; pop. 750,000; cap. Managua; **2504–5, 679–80,** *map,* **680**; Morgan's filibustering expedition, **2802**.

**Nicaragua, Lake,** largest lake in Cent. Amer., in s.w. Nicaragua; drained by San Juan R.; **2505**.

**Nicaragua Canal, 2505, 1066, 2653.**

**Nicaria** (*nē-kä-rē'ä*). Anc. Icaria, Gk. isl. in Aegean Sea 130 mi. s.e. of Athens; taken from Turkey after Balkan Wars 1912–13; 83 sq. mi.; produces charcoal, sponges.

**Niccoli** (*nēk'kō-lē*), **Niccolo de'** (1363–1437). Ital. humanist, **2996**.

**Nice** (*nēs*), France, resort on Riviera; pop. 145,000; **2505**; ceded to France, **1837, 3638**; perfume industry, **2728**.

**Ni'cene Creed, 870.**

**Nicholas** (*nĭk'ō-lȧs*) or **Nikita** (1841–1921), hereditary prince of Montenegro; succeeded 1860; assumed title of king 1910; driven into exile by Germans during World War; deposed 1918 when Montencgro became merged into Jugo-Slavia; **2313**.

**Nicholas I.** Pope 858–867; one of the most vigorous of the early popes, uncompromising in upholding his claims to universal jurisdiction; first pope of whom it is recorded that he was formally crowned.

**Nicholas II.** Pope 1059–61; he restricted election of popes to College of Cardinals; Hildebrand (later Gregory VII) was soul of his pontificate.

**Nicholas III,** pope 1277–80; materially strengthened temporal power of the church; man of strict morals and considerable learning; and Univ. of Paris, **831–2**.

**Nicholas IV.** Pope 1288–92; General of the Franciscans 1274 (first Franciscan pope); tried to rouse Christian world against advancing Moslems.

**Nicholas V,** pope 1398–1455; founded valuable library and manuscript collection; extended wide patronage to classical scholars of Renaissance; **2996**.

**Nicholas I** (1796–1855), czar of Russia, **2505–6, 3090**.

**Nicholas II** (1868–1918), czar of Russia, **2506, 3092, 3094–5, 1089**; correspondence with William II, **3738**.

**Nicholas, Grand Duke** (born 1856). Grandson of Czar Nicholas I; appointed commander-in-chief of Rus. army 1914; took field in person in vain attempt to check Austro-German offensive of 1915; later commander-in-chief in Caucasus where he carried out successful offensive, contributing greatly to relieve situation of Allies in East.

**Nicholas, Saint** (4th cent.), bishop of Myra, Asia Minor; in many legends, bountiful patron of children; his feast day (Dec. 6) is near Christmas; hence he comes to be the Christmas gift-bringer. "St. Nick" or "Santa Claus"; **759**.

**Nicholas II Land,** archipelago in Arctic Ocean, n. of cent. Siberia; discovered in 1913; **189**.

**'Nicholas Nickleby'.** Novel by Charles Dickens in which the evils of cheap schools are disclosed; the hero began his career at Squeers' school, Dotheboys Hall, Yorkshire.

**Nicholas of Pisa.** *See in Index* **Pisano, Niccolo.**

**Nichols, Robert** (born 1893), Eng. poet; prof. of English literature at Tokio Univ. ('Ardours and Endurances'; 'The Flower of Flame'); **1168**.

**Nicholson, Meredith** (born 1866), Amer. novelist and essayist, b. Crawfordsville, Ind. ('The House of a Thousand Candles'; 'The Port of Missing Men'; 'A Hoosier Chronicle'; 'The Valley of Democracy'), **1762**.

**Nicholson, William** (1753–1815), Eng. writer and lecturer; edited *Journal of Natural Philosophy, Chemistry, and the Arts,* earliest work of the kind in Gt. Brit.; wrote 'An Introduction to Natural Philosophy'; discovers decomposition of water by voltaic current, **1121**.

**Nicias** (*nĭsh'i-ȧs*) (d. 414 B.C.). Athenian statesman and general in Peloponnesian War; became leader of aristocrats on death of Pericles; arranged Peace of Nicias (421 B.C.) between Athens and Sparta, which terminated first decade of Peloponnesian War.

**Nick'el,** a metallic element, **2506–7, 4042**; in alloys, **99, 2831**; Canadian

resources, **610, 2582,** *picture,* **2583;** electrolytic refining, **1125;** origin of name, **816;** oxide used in enamel, **1146;** in steel armor plate, **216, 2204.**

**Nicknames, 2507;** of states of U.S., **3347;** origin of "Yankee," **3828.**

**Nicobar** (*nĭk-ō-bär'*) **Islands,** group of isls. in Bay of Bengal n.w. of Sumatra; chief product coconuts; **1756, 1763.**

**Nicode'mus,** in New Testament, a prominent Pharisee, who visited Jesus by night as an inquirer (John iii); helps to bury Jesus, **1888.**

**Nicolay** (*nĭk'ō-lā*), **John George** (1832–1901), Amer. author, secretary to Lincoln, b. Bavaria; joint author of 'Abraham Lincoln, A History', **2016.**

**Nicolay, Helen** (born 1866), Amer. author, daughter of J. G. Nicolay, b. Paris, France ('The Boy's Life of Ulysses S. Grant'; 'The Book of American Wars'; 'The Boy's Life of Lincoln'), **2016.**

**Nicolet** (*nē-kō-lā'*), **Jean,** early Fr. explorer in Amer. (1634–35), **3768, 3772;** passes through Straits of Mackinac, **2226.**

**Nic'oll, Sir William Robertson** (born 1851). Eng. man of letters, known as authority on the Brontë family ('Literary Anecdotes of the Nineteenth Century'; 'Life of Ian Maclaren'; 'Life of the Brontës').

**Nicolls, Sir Richard** (1624–72). First Eng. colonial gov. of N.Y.; sent to America to organize attack on New Netherlands; firm conciliatory executive; won respect both of Dutch and English.

**Nicomedia** (*nĭk-ō-mē'dĭ-ȧ*) or **Actia Nicopolis.** Anc. city of great splendor on e. arm of Propontis (Sea of Marmora); cap. of Bithynia; Constantine died here, and Hannibal committed suicide near by; modern Ismid.

**Nicopolis** (*nĭ-kŏp'ō-lĭs*), important anc. city, now in ruins, in Epirus on w. coast of Greece; founded 31 B.C. by Emperor Augustus to commemorate his naval victory of Actium; Epictetus' school, **1173.**

**Nicopolis** or **Nikopoli,** Bulgaria, town in n. on Danube at junction with Osem; pop. 6000; military post; Turks win, **3559.**

**Nicot** (*nē-kō'*), **Jean** (1530–1600), Fr. diplomat, brought tobacco seeds from Lisbon to France; scientific name of tobacco given in his honor, **3510.**

**Nicotia'na,** the tobacco plant genus, **3510.**

**Nic'otine,** poisonous alkaloid in tobacco, **3510;** chemical properties, **10;** sulphate used to kill insects. **3331.**

**Niebuhr** (*nē'bu̇r*), **Barthold Georg** (1776–1831). Ger. historian and classical scholar, pioneer in modern historical methods ('Roman History', "epoch-making" work).

**Niehaus** (*nē'hous*), **Charles Henry** (born 1855). Amer. sculptor, b. Cincinnati, Ohio (statues of Garfield and McKinley).

**Niel'son, Alice** (born 1876). Amer. dramatic soprano; won first success in comic opera; famous for Mozart rôles.

**Niemen** (*nē'mĕn*), r. 500 mi. long dividing Lithuania from Russia and Poland in s., and flowing n. and w. through Lithuania to Baltic; highway for lumber and farm products; called Memel at mouth; internationalized by Treaty of Versailles; scene of Peace of Tilsit, **2396.**

**Niepce** (*nē-ĕps'*), **Joseph Nicéphore** (1765–1833), Fr. physicist, one of inventors of photography, **2784.**

**Nietzsche** (*nēch'ē*), **Friedrich Wilhelm** (1844–1900), Ger. philosopher; exalted self-assertion, the "will to power," as the final self-justifying good in life; denounced Christian virtues of pity and humility as "slave morality"; died insane; chief works, **1438,** *picture,* **1436.**

**Nieuwvelt** (*nyü'vĕlt*) or **Nieuwveld Mts.,** division of main range in province of Cape of Good Hope, S. Africa, **36.**

**Niflheim** (*nĭf'l-hām*). In Norse myth., land of eternal cold and night.

**Nigeria** (*nī-ĝē'rĭ-ȧ*). Brit. colony in lower basin of Niger R. in W. Africa; 332,000 sq. mi.; pop. 17,500,000; chief port Lagos; exports palm products, cocoa, hides; tin mines; *map,* **40–1.**

**Niger** (*nī'ĝĕr*) **River,** 3d largest r. of Africa (2600 mi.), **2507–8, 3384, 34.**

**"Nigger-toe,"** or Brazil nut, **2545–6.**

**Night-blooming cereus,** a hothouse cactus, **563.**

**Nighthawk,** a bird of the goatsucker family, **2508,** *picture,* **416;** nesting habits, **406;** number of insects consumed, **402.**

**Nightingale, Florence** (1820–1910), Eng. war nurse, **2509;** influence on nursing and hospitals, **2544, 1687.**

**Nightingale,** a song-bird, **2508–9;** migrating instinct, **130.**

**Nightjar,** various large-mouthed insect-eating birds, including nighthawks, **2508;** foot, *pieture,* **409.**

**Nightshade,** a plant with poisonous properties, **2509,** *picture,* **2853.**

**Nightshade family,** or *Solanaceae,* family of herbs and plants with small flowers, and usually containing poisonous alkaloids, **2509, 3943;** includes European bittersweet, **432;** petunia, **2759;** potatoes, **2901;** tobacco, **3510;** tomato, **3512–3.**

**'Night Watch, The',** painting by Rembrandt, **2995.**

**Ni'grosin,** a black aniline dye, **1779.**

**Nihilists** (*nī'hĭl-ĭsts*), Rus. revolutionists, **3097, 3555;** assassinate Alexander II, **85.**

**Nihon-bashi,** famous Tokyo bridge, **3511.**

**Nijni-Novgorod.** *See in Index* **Nizhni-Novgorod.**

**Nikau** (*nē'kou*) **palm,** of New Zealand, **2499.**

**Nike** (*nī'kē*). In Gk. myth., goddess of victory.

**Nike Apteros** or **Wingless Victory, Temple of,** *picture,* **250.**

**Nikisch** (*nēk'ĭsh*), **Arthur** (1855–1922). Hungarian orchestral conductor, especially noted for interpretations of Wagner; conductor of Boston Symphony Orchestra 1889–93.

**Nikko** (*nēk'ō*), religious center in Japan noted for Shintoist and Buddhist temples, *picture,* **1863.**

**Nikolaief** (*nē-kō-lī-ĕf'*) or **Nikolayev.** Fortified grain port in s. Russia on Black Sea near mouth of Bug R., 70 mi. n.e. of Odessa; pop. 107,000.

**Nile, battle of** (1798), Fr. fleet destroyed by Nelson in Aboukir Bay, **2435, 2393.**

**Nile River,** longest r. of Africa (4000 mi.), **2509–10, 1092–6,** *map,* **1095;** Assuan dam, **1094, 568,** *picture,* **1096;** bird's-eye view of lower Nile, **2940;** crocodiles, **923;** delta, **1096;** early canals, **625;** irrigation, **1092, 1094, 1096,** *picture,* **1093;** Philae ruins, *picture,* **1106;** source, **2510, 3641;** explored by Speke, **38, 3641;** Suez Canal, **3384;** supplies water to Jerusalem, **2646.**

**Niles,** Ohio. Mfg. center on Mahoning R. 50 mi. s.e. of Cleveland; pop. 13,080.

**Nil'gai,** an Indian antelope, **146,** *picture,* **147.**

**Nilgiri** (*nĭl'ĝī-rē*) **Hills.** Plateau in s. India; highest point 8760 ft.; forms dist. of Madras Presidency.

**'Nils, The Wonderful Adventures of',** story for children by Selma Lagerlöf, **1957.**

**Nilsson** (*nĭl'sȯn*), **Christine** (1843–1921). Swedish operatic soprano; made début in 1864, retired 1888.

**Nim'bus,** a rain cloud, **809.**

**Nimeguen** (*nē'mā-ĝĕn*) or **Nimwegen,** Holland. Mfg. and trading center on Waal R.; pop. 67,000; anc. Rom. camp.

**Nîmes** (*nēm*), city in s. France 60 mi. n.w. of Marseilles; pop. 80,000; silk trade and mfrs.; wine and brandy market; Rom. ruins, **1350,** *picture,* **1342.**

**Nim'rod.** In Genesis x, 8–9, a mighty hunter and founder of the Babylonian and Assyrian empires.

**Nimule,** trading post in n. Uganda, **1068.**

**Niña** (*nēn'yȧ*). One of the three caravels of Columbus on his first voyage to America.

**"Nine-days' queen," 1542.**

**Ninety-five Theses, 2085, 2987.**

**Nineveh** (*nĭn'ē-vē*), cap. of anc. Assyrian Empire, **2510, 298.**

**Ningpo** (*nĭng-pō'*), China. Treaty port 80 mi. s. of Shanghai on Ningpo R.; pop. 670,000; commerce in tea, silk, cotton, carpets, fish, and sugar.

**'Ninth Diamond, The',** story of Sir Lancelot, **3069–70.**

**Niobe** (*nī'ō-bē*), in Gk. myth., woman whose children were slain because of her pride, **2510.**

**Niobrar'a River,** Neb., rises in s.e. part of Wyo., and flows e.. through n. Neb. for 450 mi. into Missouri R.; canyons, **2429.**

**Niort** (*nē-ôr'*), town in w.-cent. France, 35 mi. n.e. of La Rochelle; gloves, **1475.**

**Nip'igon.** Lake 70 mi. long in Ontario; discharges by Nipigon R. into L. Superior.

**Nip'issing,** lake in Ontario midway between Georgian Bay and Ottawa R.; 55 mi. long; link in proposed Georgian Bay Canal, **1705.**

**Nip'pon.** Native name for Japan; means "land of the rising sun"; Dai Nippon, "Great Nippon."

**Nippur** (*nĭp-pu̇r'*), anc. city of Mesopotamia, 50 mi. s.e. of Babylon; flourished 4000 B.C.; excavated by U. of Pennsylvania; library, **1992.**

**Nirvana** (*nĭr-vä'nȧ*), **525.**

**Nish** (*nēsh*), Jugo-Slavia, Serbian town 130 mi. s.c. of Belgrade; pop. 25,000; anc. Naissus, birthplace of Constantine the Great; held by Turks 1456–1878; strategic value due to converging roads and railroads; in World War, **3806.**

**Nishapur** (*nĭsh-ȧ-pu̇r'*), formerly important town in n.e. Persia; pop. 15,000; **2734.**

**Ni'ter.** Same as **Saltpeter.**

**Ni'trates, 2511;** bacteria produce, **302, 89, 2829;** Chile deposits. **736, 3118,** *pictures,* **737, 2512;** as fertilizers, **1235, 2511–2;** invisible inks, **1779;** obtained by plants, **2829–30;** of potassium, sodium, and calcium, **3118;** saltpeters, **3118;** silver, **3242, 2261;** of sodium, **3118, 1235, 2510–2;** used in gunpowder, **1552–3.** *See also in Indcx* **Nitrogen.**

**Nitric acid, 2510–1;** in *aqua regia,* **1482;** dissolves nickel, **2507;** in explosives manufacture, **1212, 1050.**

**Nitric oxide, 2510, 1383.**

**Ni'trifying bacteria, 2511–2, 302,** *pictures,* **810, 302, 89;** compared with fertilizers, **1235;** partnership with alfalfa and other legumes, **2829–30, 89, 809.**

**Nitrocel'lulose,** an explosive, **673, 2511;** action in smokeless powder, **1212.**

**Ni'trogen,** a gaseous element, **2511–2, 4042;** in atmosphere, **50, 51,** *diagram.* **52;** calcium carbide fixation process. **571;** electric furnace fixation, **1383;** in electric light globes, **1123, 1124;** in explosives, **1211, 1212;** "fixed" by bacteria, **2511–12, 302, 89,** *pieture,* **810;** in illuminating gas, **1406;** in plant

food, **2824, 2829–30, 1235,** *picture,* **2821;** liquefied, **2025;** in proteins, **2926;** in protoplasm, **394, 2926.**
**Nitroglyc'erin,** an explosive, **1050, 2511.**
**Nitrous oxide,** or "laughing gas," an anesthetic, **125;** Davy discovers anesthetic properties, **969.**
**Niuchwang.** Same as **Newchwang.**
**Nivelle, Robert Georges** (born 1856). World War general who rose from colonel in 1914 to commander-in-chief of the Fr. armies in Dec. 1916; succeeded by Foch May 1917 after failure of spring offensive.
**Nix'ies,** water fairies, **1219.**
**Niza, Fray Marcos de.** *See in Index* **Marcos.**
**Nizam** (*ni-zäm'*), ruler of Hyderabad, India, **1707,** *picture,* **1756.**
**Nizhni-Novgorod** (*nēzh'nē nŏv'gō-rŏd*), great trade center of e. Russia; pop. 112,000; fairs, **3088, 1219,** *picture,* **3094.**
**Noah** (*nō'ä*), in Genesis vi-ix, builder of the Ark, in which he and his family and one pair of every kind of animal were saved from the Deluge; ancestor of the human race through his sons, Shem, Ham, and Japheth; landing place, **232;** Babylonian legend, **299.**
**Nobel** (*nō-bĕl'*), **Alfred Bernhard** (1833–96), Swedish chemist and engineer; invents dynamite, **1050;** founds Nobel prizes, **2512.**
**Nobel prizes, 2512.**
**Nocera** (*nō-chā'rä*) **Inferiori,** Italy. City 20 mi. s.e. of Naples; pop. 23,000; linen and woolen mfrs.; anc. Nuceria Alfaterna, reduced by Hannibal 216 B.C.
**Noctuidae** (*nŏk-tū'ĭ-dē*) or owlet moth family, **3947.**
**Noc'tule,** a type of bat, *picture,* **345.**
**Noël** (*nō-ĕl'*), **Bonhomme** (Father Christmas), **759.**
**Nogales** (*nō-gä'läz*), Ariz. City on Mex. border, separated by a street from Nogales, Mexico; pop. 5199; port of entry for w. coast of Mexico; mining and cattle interests.
**Nogi** (*nō'gē*), **Ki-Ten Marosuke, Count** (1849–1912), Japanese general, victor of Port Arthur and Mukden in Russian war, **3098.** He and his wife killed themselves in accordance with Samurai custom, at the time of the mikado's funeral.
**Noise,** distinguished from music, **3278;** effect on nerves, **1716.**
**Noko'mis,** in Hiawatha story, **2059, 2060.**
**Nola** (*nō'lä*), Italy. City 16 mi. n.e. of Naples; pop. 15,000; prominent in Rom. times; Augustus died there 14 A.D.
**Nolan, Philip,** hero of E. E. Hale's 'The Man Without a Country', **1562–5.**
**Nomad'ic life,** beginning of, **772.**
**"No man so good was ever so bad a king," 693.**
**Nome** (*nōm*), Alaska, gold-mining town and seaport in center of w. coast on Seward peninsula; pop. 852, was 20,000 during rush of 1899–1900; ships reindeer; **79.**
**Non-commissioned officers,** in U.S. army, **218.**
**Nonconform'ists.** *See in Index* **Dissenters.**
**Nones.** In anc. Rom. calendar the 9th day before the ides, falling in March, May, July, and Oct. on the 7th of the month, in other months on the 5th.
**Non-Euclid'ean geometry, 1428.**
**Non-importation agreements, 3001.**
**Non-Intercourse Act,** U.S., **3671.**
**Nonpareil** (*nŏn-pà-rĕl'*) **type, 3572.**
**Non-Partisan League, 2870;** in N.D., **2525, 329.**
**Noot'ka Indians,** tribe of N. Pacific area, dwelling on Vancouver Isl. and in s. British Columbia, **1767.** Indians gave name to sound and isl. on w. coast of Vancouver Isl.
**No'pal,** a cactus of the opuntia or prickly pear genus, **817.**
**Nor'bert, Saint** (d. 1134), Ger. ecclesiastic, archbishop of Magdeburg; founds Premonstratensians, **2299.**
**Nordau** (*nôr'dou*), **Max** (born 1849). Jewish author and philosopher, b. Hungary; leader in European Zionist movement ('Degeneration', criticism of modern civilization and art).
**Nordenskjöld** (*nôr'dĕn-shûld*), **Nils Adolf Erick, Baron** (1832–1901), Swedish Arctic explorer, first to accomplish (1878–80) the Northeast Passage from Atlantic to Pacific; *map* of voyage, **189.**
**Nor'dica, Lillian** (1859–1914). Amer. operatic soprano, b. Farmington, Me. (Marguerite in 'Faust'; Elsa in 'Lohengrin'; Isolde in 'Tristan and Isolde'); concert and operatic tours in every part of world; died in Java as result of exposure from shipwreck.
**Nor'dic race,** of mankind, **2956.**
**Nördlingen** (*nûrt'lĭng-ĕn*). Town in Bavaria, s. Germany, 70 mi. n.w. of Munich; in Thirty Years' War, scene of Imperialist victory over Swedes (1634) and defeat by French (1645).
**Nor'folk.** Large county in e. England bounded n. and e. by North Sea; 2044 sq. mi.; pop. 490,000; cap. Norwich; agriculture, cloth mfrs.
**Norfolk,** Neb. Commercial center for farming and stock-raising dist.; pop. 8634; on Elkhorn R. 95 mi. n.w. of Omaha; flour and cereal mills, packing houses.
**Norfolk,** Va., seaport on Elizabeth R. opposite Portsmouth; pop. 115,777; **2513, 3650;** peanuts, **3648.**
**Norfolk Island,** isolated isl. 800 mi. e. of Australia, which governs it; 13 sq. mi.; Brit. cable station; **2624,** *map,* **264–5.**
**Norfolk Navy Yard, 2513.**
**No'ria,** a Persian wheel for lifting water, **2934.**
**Normal,** Ill. Town 2 mi. n. of Bloomington; pop. 5143; Illinois State Normal Univ.
**Norman,** Okla., mfg. and agricultural center 20 mi. s. of Oklahoma City; pop. 5000; U. of Oklahoma; **2577.**
**Norman Conquest** (of England), **3739, 1152–3, 2513;** battle of Hastings, **1595–6;** effect on Eng. language, **1163, 1162.**
**Nor'mandy,** province of France on English Channel, **2513,** *map,* **1351;** Channel Isls., **687, 1344;** cider, **1346;** cotton and lace manufactures, **1348;** history, **2513, 2526, 3739, 1633;** mountains and rivers, **1345.**
**Normans,** Northmen who founded Normandy, **2526, 2513;** armored warrior, *picture,* **215.**
**Norns.** In Norse myth., the three Fates (Urd, personifying the past; Verdandi, the present; Skuld, the future); Asgard was their home.
**Norris, Frank** (1870–1902). Amer. novelist, b. Chicago ('The Octopus'; 'The Pit', first and second parts of an unfinished trilogy, "the epic of the wheat").
**Norristown,** Pa. Borough 14 mi. n. w. of Philadelphia on Schuylkill R.; pop. 32,319; limestone quarrying, and agricultural region; machinery, hosiery, underwear, glass and iron products, cigars.
**Norrköping** (*nôr'chû-pĭng*), Sweden, seaport on s.e. coast 80 mi. s.w. of Stockholm; pop. 58,000; important trade and manufactures; **3403.**
**Norr'land,** n. province of Sweden, **3403–4.**
**Norse.** *See in Index* **Northmen; Scandinavian languages and literature.**
**North, Christopher.** *See in Index* **Wilson, John.**
**North, Frederick, Baron** (1732–92), later Earl of Guilford (better known as Lord North), Brit. statesman; as king's agent (disclaimed title of prime minister) introduced Boston Port Bill, 1774, and, against own conviction, supported George III's policies which led to Amer. Rev., **2869;** and surrender of Yorktown, **3004, 1430.**
**North, Sir Thomas** (1535?–1601?). Eng. translator of Plutarch (first edition 1579); vigorous style greatly influenced Eng. prose; Shakespeare took whole speeches in 'Julius Caesar' and other plays directly from North's 'Plutarch'.
**North Adams,** Mass. City on Hoosac R. 50 mi. n.w. of Springfield; in Berkshire Hills near w. end of famous Hoosac Tunnel; pop. 22,282; machinery, textiles, boots and shoes, creamery products; site of old Ft. Massachusetts.
**North America,** the 3d largest continent; 10,050,000 sq. mi.; pop. 143,000,000; **2514–7,** *maps,* **2514–5,** *Study Outline,* **3869–91;** Arctic regions, **2515–6, 189–90;** Cent. Amer., **679–82;** climate, **794–5, 2514, 2516–7;** coast-line and harbors, **2514, 2517;** compared with other continents, **3284–5,** *picture,* **2791;** elevation, **2791,** *map,* **2514–5;** fisheries, **1283;** fur trade, influence on colonization, **1389;** geographic influences on settlement, **2514–5, 2517, 3581–2, 158;** geologic history, **2516–7, 1334;** Ice Age, **1720, 1721, 1466;** lakes and rivers, **2515, 1957, 1510–4;** L. Agassiz, **1721, 2790;** native races, **1765–76, 288–90, 2357, 793–4, 1174;** mountains, **2515, 2516–7, 3035–6, 158;** population, **2880,** *map,* **2514–5;** plains and prairies, **2790;** products and resources, **2515–6, 2755, 3730, 3732;** rainfall, **2516–7,** *maps,* **2973, 2514–5;** religions, **2994;** vegetation, *map,* **2514–5.**
*Exploration,* **109–10,** *map,* **110;** Cabot, **561–2;** Cartier, **651–2;** Champlain, **686–7;** Coronado, **892;** Cortez, **894–5;** De Soto, **999;** Drake, **1030–1;** Hudson, **1690;** Joliet, **1900;** La Salle, **1964–5;** Lewis and Clark, **1989–90;** Marquette, **2151;** of Mississippi R., **2265;** Northmen, **2526;** along Pacific Coast, **580, 2596;** polar, **2859–62, 2863–4, 2703–4, 120,** *maps,* **189, 120;** Ponce de Leon, **2878;** Raleigh's expeditions, **2975–6.** *See also in Index* **America; Canada; United States;** and physical features by name.
**Northampton** (*nôrth-ămp'tŏn*), England. City 60 mi. n.w. of London on Nene R.; pop. 93,000; shoe mfrs.; cap. of Northamptonshire; battle 1460 in which Yorkists captured Henry VI.
**Northampton,** Mass. City 18 mi. n. of Springfield on Connecticut R.; pop. 21,951; Smith College; silk thread, hosiery, brushes, cutlery, baskets, paper boxes; settled 1654.
**Northamptonshire.** An e.-midland county of England; 1003 sq. mi.; pop. 355,000; cap. Northampton; cattle-raising, shoe mfg.
**'Northanger Abbey'.** Novel by Jane Austen; deals with life of commonplace people at the abbey and at Bath.
**North Anna,** stream n. of Richmond, Va.; battle 1864 between Grant and Lee, followed by Federal advance, **1498.**
**North Battleford,** Saskatchewan. Mfg. town 230 mi. n.w. of Regina at junction of Saskatchewan and Battle rivers; pop. 4000.
**North Bay,** Ontario. Lumbering, mining, and r.r. town about 200 mi. n.w. of Ottawa on L. Nipissing; pop. 11,000; planing and saw mills, car repair and machine shops.
**North Bend,** Ohio, village in extreme s.w. on Ohio R.; pop. 597; home of W. H. Harrison, **1593.**

**North Braddock,** Pa. Residential and mfg. suburb 8 mi. s.e. of Pittsburgh; pop. 14,928; extensive steel rail works.
**Northbridge,** Mass. Town 12 mi. s. e. of Worcester on Mumford R.; pop. 10,174; textiles, textile machinery, embossed paper, silk.
**North Cape,** Norway, northernmost point of Europe, **2534,** *map,* **2531.**
**North Carolina,** s. Atlantic state of U.S.; 52,426 sq. mi.; pop. 2,559,123; cap. Raleigh; **2517–21,** *maps,* **2518, 3584–5;** cities, **2519, 2520;** industries and products, **2518–20, 3509;** meaning of name, **3347;** minerals, **2520, 2219;** physical features, **2517–8;** state flower, **3347;** suffrage, **3385.** —*History.* **2520–1, 1665;** in Rev. War, **3004;** loses Tennessee region, **3181, 3469;** secedes, **857.**
**North Carolina, University of,** at Chapel Hill, N.C.; co-ed.; chartered 1789 (opened 1795); liberal arts, applied science, education, law, medicine, pharmacy; state institution; *picture,* **2520.**
**Northcliffe, Alfred Harmsworth,** first **Viscount** (1865–1922), Eng. newspaper proprietor, one of the most powerful figures in 20th cent. journalism; owner of London *Times, Daily Mail, Evening News,* etc., and founder of the Amalgamated Press, the world's largest periodical publishing business; during World War exerted immense influence on public opinion and govt. policies; chairman of Brit. War Mission to U.S. 1917; director of propaganda in enemy countries 1918; supports Lloyd George, **2040.**
**North Dakota,** a plains state of n.w. U.S.; 70,837 sq. mi.; pop. 645,680; cap. Bismarck; **2522–5,** *maps,* **2524, 3584–5;** agriculture, **2524–5, 1292;** Bad Lands, **2522,** *picture,* **2524;** climate, **2524;** government and education, **2525;** Lake Agassiz, **1721;** Lewis and Clark expedition, **1989;** minerals, **2522, 2524;** Non-Partisan League, **2525, 2870, 329;** origin of name, **2525;** physical features, **2522, 2986, 2273–4;** population, **2525;** state flower, **3347;** Sully's Hill Park, **2400.**
**North Dakota, State University of,** at Grand Forks, N.D.; co-ed.; established 1883; liberal arts, law, engineering, education, commerce, pharmacy; *picture,* **2523.**
**North Dakota Agricultural College.** At Fargo, N.D.; co-ed.; state control; opened 1891; agriculture, domestic science, engineering, pharmacy.
**North Downs,** England. *See in Index* **Downs.**
**Northern lights, 259,** *picture,* **260.**
**Northern Pacific Railroad, 2963, 3690.**
**Northern Rhodesia.** *See in Index* **Rhodesia.**
**Northern Territory,** a division occupying the n.-cent. part of Australia; 523,620 sq. mi.; pop. (white) 3870; gold, tin, copper; cattle-raising; *map,* **264–5.**
**Northern War** (1700–21), between Charles XII of Sweden and Denmark, Russia, and Poland, **698, 2747.**
**Northfield,** Minn. City 35 mi. s. of St. Paul in agricultural and dairying region; pop. 4023; Carleton College, St. Olaf College.
**North German Confederation** (1866–70), **1448, 428, 1356.**
**North Holland,** a province of The Netherlands, **1673.**
**North Island,** 2d largest isl. of New Zealand; 44,130 sq. mi.; **2499, 2500.**
**North Little Rock, Ark.** Suburb of Little Rock on opposite side of Arkansas R., formerly called Argenta; pop. 14,048; r.r. shops, cotton oil mills, boiler and iron works; natural gas.
**North magnetic pole.** *See in Index* **Magnetic poles.**
**Northmen** or **Vikings, 2525–8, 3134, 1195;** discover America, **2526, 109;** ancestors of Danes, **997;** in England, **1152, 90, 1087, 639;** discover Greenland, **1540;** settle Iceland, **1722–3;** in Ireland, **888;** in Italy, **2391, 3057;** in France, **2513, 2526;** invade Scotland, **3489, 2601, 1625, 3206;** ships, **2525, 3208,** *picture,* **2526;** in Sweden, **3402, 3404.**
**North Park,** mountainous plateau in n. Colo., **841,** *map,* **840.**
**North Platte,** Neb., trade center of agricultural region at junction of N. and S. Platte rivers; pop. 10,466; r.r. repair shops, grain elevators; export products, **2432.**
**North Platte,** r. rising in Rocky Mts. in North Park, Colo.; crosses Wyo. and unites with s. fork to form Platte R. in n.w. Neb.; 750 mi.; irrigation project, **1829, 2430.**
**North Pole,** the n. extremity of earth's axis; discovered by Peary, **2704, 2862;** latitude and longitude, **1968–9.** *See in Indcx* **Polar exploration.**
**North River,** lower course of Hudson R., **2487, 1692.**
**North Sea,** the part of the Atlantic between Gt. Brit. and continent of Europe, **2528, 1191,** *map,* **1196–7;** amber, **106;** fisheries, **1190, 2528;** World War mine barrage, **3518–20, 2528, 1282.**
**North Somerset,** large isl. of Amer. Arctic directly n. of Boothia; about 10,000 sq. mi.; *map,* **602–3.**
**North Star** or **Polaris,** star nearest in line above North Pole, **3342;** located by "Dipper," *pictures,* **239, 3343, 873;** not visible s. of equator, **3285.**
**North Tonawan'da,** N.Y. Mfg. city 10 mi. n. of Buffalo on Niagara R., opposite Tonawanda, and on Erie Canal; pop. 15,482; extensive lumber and iron interests.
**Northum'berland, John Dudley, Duke of** (1502–53), Eng. statesman, an unprincipled and subtle intriguer; executed for high treason following plot to put Lady Jane Grey on throne; **1089, 1542.**
**Northumberland,** large county in extreme n.e. of England; 2018 sq. mi. pop. 741,000; sheep rearing, coal and iron mining; cap. Newcastle-upon-Tyne, **2449.**
**Northumbria** (*nôrth-ŭm'brĭ-à*). Anc. kingdom in n.e. England, most powerful on isl. in 7th cent.; made tributary to Wessex in 827.
**Northwestern College.** At Naperville, Ill.; co-ed., Evangelical; founded 1861; liberal arts, commerce, music, art.
**Northwestern College.** At Watertown, Wis.; Lutheran college for men; founded 1865.
**Northwestern University.** At Evanston, Ill.; co-ed.; Meth. board; opened 1855, chartered 1851; liberal arts, medicine, law, pharmacy, dentistry, music; Garrett Biblical Institute.
**Northwest Frontier Province,** northernmost province of Brit. India, created 1901; 38,665 sq. mi.; pop. 3,820,000; almost wholly agricultural; **1744.**
**Northwest Fur Company,** formed 1784 by Fr.-Canadian merchants and confined largely to Pacific coast regions; rival of Hudson's Bay Co., **1692;** employs Sir Alexander Mackenzie, **2102;** founds Ft. William, **1333;** in Manitoba, **2137.**
**Northwest Mounted Police, 2866, 2528,** *picture,* **2865.**
**Northwest Passage, 617, 109–10, 2860;** Amundsen, **2864, 120, 617;** Cartier, **652, 109;** Hudson, **1690, 110;** McClure, **2860, 110.**
**Northwest Territories,** Canada, **2528, 603,** *map.* **602–3;** Hudson's Bay Co., **1692;** police system, **2866.**
**Northwest Territory,** region in U.S. n. of Ohio R. from which Ohio, Ind., Mich., Ill., and Wis., were formed, **2528–9, 2484;** Clark conquers for colonies, **783, 3004;** Ordinance of 1787, **2529, 2227, 1882;** forts held by British, **3604;** administration of William H. Harrison, **1593–4, 3452;** Tecumseh's uprising, **3451–2, 1594;** states organized from, **1736, 1762, 2227, 2572, 3772.**
**North'wich,** England. Town 20 mi. s.e. of Liverpool; pop. 18,000; salt mines.
**Norton, Charles Eliot** (1827–1908). Amer. scholar and author, b. Cambridge, Mass.; foremost Amer. Dante scholar (prose translation of Dante's 'Divina Commedia').
**Norwalk,** Conn. City on Long Island Sound, 40 mi. n.e. of New York City; pop. 27,743; hats, paper, underwear, hardware, machinery, lace, shoes; oyster culture; burned by British and Hessians in Rev. War.
**Norway,** a kingdom of n.w. Europe, in w. part of Scandinavian peninsula; 125,000 sq. mi.; pop. 2,695,000; cap. Christiania; **2529–36,** *maps,* **1196–7, 2531;** agriculture, **2534, 2900;** chief cities, **2532, 2534, 758;** Christmas customs, **759, 760;** climate, **2530, 2534, 1549;** coöperative movement, **2534, 879;** elevation, *map,* **1190–1;** fiords, **2529–30, 2532, 1191,** *pictures,* **2534, 2789;** fishing industry, **2536, 2532, 2534, 1285, 1190,** *pictures,* **3724, 3725;** foreign trade, **2534, 2536, 1190;** forests and forest products, **2532, 2536, 2808;** government, **2536;** language and literature, **3134, 432, 1720;** Lapland, **1962;** manufactures, **2536;** merchant marine, **2536, 3219;** minerals, **2536;** physical features and scenery, **2529–30, 2532;** population, *map,* **1190–1;** rainfall, *map,* **1190–1;** skiing, **2530, 3754;** vegetation, *map,* **1190–1.** —*History,* **2536;** Northmen, **2525–8;** Canute, **639;** Greenland colonized, **1540;** Iceland colonized, **1724;** Union of Kalmar, **997;** Charles XII attempts to conquer, **698.**
**Norway Deep, 2528.**
**Norway maple, 2138.**
**Norway pine, 2808, 2809.**
**Norway spruce, 3332;** favored for hedges, **1627.**
**Norwegian** or **brown rat, 2977.**
**Norwich,** Conn. Mfg. and trade center at head of navigation on Thames R., 35 mi. s.e. of Hartford; pop. 22,304; extensive waterpower; firearms, leather, textiles; settled 1659.
**Norwich** (*nôr'ĭj*), England. Mfg. and trade center, cap. of Norfolk County on Wensum R. near North Sea, 100 mi. n.e. of London; pop. 125,000; fine Norman cathedral; importance dates from Middle Ages.
**Norwood,** Mass. Town 14 mi. s.w. of Boston; pop. 12,627; printing and tanning works, r.r. shops; glue, ink, floor covering and roofing, piano supplies.
**Norwood,** Ohio. Suburb n.e. of Cincinnati; pop. 24,966; bookcases, washing machines, pianos, electrical supplies, playing cards.
**Nose,** the organ of smell, **3252;** breathing, **1714, 2998.**
**Nosebleed,** treatment for, **1270.**
**Nota'tion,** in arithmetic, **198, 2542–3.**
**Notation,** in music, **2376, 2377.**
**Note,** a musical sound, physical nature of, **3278.**
**Note,** short term security, **3359.**
**Note,** promissory, **2725–6, 328.**
**No'tochord,** a gristly backbone, **3634.**
**Notre Dame** (*nō-tr dăm'*), cathedral at Antwerp, **153,** *picture,* **375.**
**Notre Dame,** cathedral at Montreal, **2317;** great bell, **379.**
**Notre Dame,** cathedral at Paris, **2682, 2762,** *pictures,* **185, 186.**

**Notre Dame, University of.** At Notre Dame, Ind.; Rom. Cath. institution for men; founded 1842; arts and science, engineering, architecture, law.
**Notre Dame Mts.,** Quebec, **2945.**
**Not'tingham,** England, city 110 mi. n.w. of London on Trent R.; pop. 268,000; center of lace and hosiery mfr.; **1160, 1949;** Arkwright, **210;** Hargreaves, **1589.**
**Nottingham, The Sheriff of,** and Robin Hood, **3030–3.**
**Nottinghamshire** or **Notts.** County in cent. England; 843 sq. mi.; pop. 650,000; cap. Nottingham.
**No'tus,** in Gk. myth., the south wind, **29.**
**Noun, 2537, 1493;** participle as, **3628;** phrase or clause as, **3175;** relation to verb, **3627, 3174.**
**Nourse, Joel,** Amer. inventor, **3787.**
**Novac'ulite,** fine-grained rock made of quartz particles; Arkansas deposits, **207.**
**Novae** (*nō'vē*), new stars, **3343, 3341.**
**Novalis,** (*nō-vä'lis*). Pen name of Friedrich Leopold, Freiherr von Hardenberg (1772–1801), German Romantic poet and novelist ('Hymns to Night').
**Novara** (*nō-vä'rä*), r.r. center in n. Italy 30 mi. w. of Milan; pop. 59,000; textile mfrs.; battle of, **1837.**
**No'va Scotia** (*skō'shà*), a maritime province of Canada; 21,428 sq. mi.; pop. 500,000; **2537–8;** Acadia its original name, **4, 2538;** apple orchard. *picture,* **604;** Cape Breton Isl., **639–40;** cap. Halifax, **1565–6;** legislature, **622;** Leif Ericsson, **2526;** work of Sir Charles Tupper, **3553.**
**Nova Scotia Agricultural College.** At Truro, N.S.; co-ed.; provincial institution; opened 1908.
**Nova Zem'bla** (Rus. *Novaya Zemlya,* "new land"), two isls. in Arctic Ocean, belonging to Russia; 35,000 sq. mi.; **189, 190, 2862,** *map,* **232–3.**
**Nov'el, 2539–42;** American, **114–5, 117, 2541;** Cervantes' contribution ('Don Quixote'), **683;** Defoe, **2539, 986;** English, **2539–41, 1165, 1166, 1167;** historical, created by Scott, **2540, 3151;** how to judge, **2542;** romance distinguished, **2539, 3039–40;** Russian, **3097, 2541;** Spanish, **3308.** *See also* under names of chief novelists.
**Novel'la, 2539, 2541.**
**Novem'ber,** 11th month of year, **2542;** birthday stone, **1409.**
**Novgorod** (*nŏv'gō-rŏd*), historic town in w. Russia 100 mi. s. of Petrograd near n. end of L. Ilmen; pop. 29,000; old fortress; great trade center in Middle Ages; conquered by Ivan the Great, **1853.**
**Novitiate** (*nō-vish'i-āt*) or **noviceship, 2302.**
**Novocaine** (*nō'vō-kā-ēn*), a local anesthetic, **125.**
**Novorassisk',** Russia, seaport in Caucasia, on n.e. coast of Black Sea; pop. 67,000; **664.**
**Noyes** (*nōyz*), **Alfred** (born 1880), Eng. poet ('Tales of the Mermaid Tavern'; 'The Wine Press'; 'Drake, an English Epic'; 'The Elfin Artist'); shows technical skill in different metres; virile, patriotic note in much of his work.
**Noyon** (*nwä-yôṅ'*). Historic town 60 mi. n.e. of Paris; Charlemagne crowned king in 768; birthplace of Calvin; devastated in World War.
**Nu'bia,** region in Africa, s. of Egypt, including Nubian Desert, **1093–4;** conquered by anc. Egypt, **1102.**
**Nubian Desert,** great desert in Anglo-Egyptian Sudan between Red Sea and great w. bend of Nile R., **3104,** *map,* **1095.**
**Nucleus** (*nū'klē-ŭs*), a minute body within a cell, **672;** of amoeba, **119,** *picture,* **118;** in cell division, **1642,** *pictures,* **1643, 395.**
**Nueces** (*nwā'sĕs*), r. in s. Texas, 400 mi. long, entering Gulf of Mexico through Corpus Christi Bay, **3476, 2207, 2872.**
**Nuevo Leon** (*nwā'vō lā-ōn'*), Mexico. State in n.e.; 25,032 sq. mi.; pop. 374,000; cap. Monterey.
**Nullifica'tion,** in Amer. history, suspension of a Federal law by a state, **3347;** beginning of doctrine, **14;** Calhoun's stand, **575–6;** Clay's stand, **786;** in S.C., **3348, 1857;** Webster on, **3710.**
**Numa Pompilius** (*nū'mȧ pŏm-pĭl'ĭ-ŭs*), 2d legendary king of Rome, **3041.**
**Number,** in grammar: nouns, **2537;** pronouns, **2922;** verbs, **3627.**
**Numbers, 198;** Pythagorean doctrine of, **2942.** *See also in Index* **Arithmetic.**
**Numbers, Book of.** Fourth Book of Old Testament, so called because it begins with account of census; includes part of history of Israelites during their wanderings.
**Nu'merals, 2542–3, 198.**
**Numidia** (*nū-mĭd'i-ȧ*). Anc. kingdom and Rom. province in N. Africa corresponding nearly to modern Algeria.
**Numismat'ics.** The science of coins and medals. *See in Index* **Coins; Medals.**
**Nu'mitor,** in Rom. legend, king of Alba Longa, **3058.**
**Nuñez Cabeza de Vaca.** *See in Index* **Cabeza de Vaca.**
**Nuns,** origin of term, **2302.** *See in Index* chief orders by name.
**Nureddin** (*nųr-ĕd-dēn'*), **Mah'mud** (1116–74), sultan of Syria and Egypt; and Saladin, **3112.**
**Nuremberg** (*nū'rĕm-bĕrg*) (Ger. Nürnberg), mfg. city of n. Bavaria; pop. 340,000; **2543–4, 347.**
**Nursing, 2544;** baby care, **291–4;** first aid, **1266–70;** influence of Florence Nightingale, **2509;** Red Cross, **2983–6;** training in hospitals, **1688, 2544.**
**Nut** (*nųt*), Egypt. goddess, **2602.**
**Nut butter, 2577.**
**Nutcracker.** A bird of the crow family; the only Amer. species (*Nucifraga columbiana*), usually called "Clarke's crow," is found in the w. from Mexico to Alaska; it is about a foot long with gray plumage and black and white wings and tail; it is especially fond of meat and the seeds of pine cones.
**Nut-gall.** Same as **Gall-nut.**
**Nuthatches,** a family of small tree-climbing birds, **2544,** *picture,* **420;** classified, **419, 412.**
**Nutmeg,** seed of nutmeg tree, used as spice, **2544–5, 3317, 3318,** *picture,* **3319.**
**Nutmeg** or **netted melon, 2196.**
**Nutmeg State, 863.**
**Nu'tria,** fur, **3036, 1390.**
**Nutrition** (*nū-trish'on*), human organs and processes, **2792, 1010–1;** of infants, **291–4;** in plants, **2797, 2823–6.** *See also in Index* **Digestion; Food.**
**Nuts,** hard-shelled fruits, usually of trees, **2545–6;** almond, **99–100;** buckeye, **523, 524;** butternut, **548;** chestnuts, **718–9;** chinquapin, **752;** coconuts, **818–20;** filbert, **1611;** hazel, **1611;** hickory, **1647–9;** peanut, **2700–1;** pecan, **2705–6;** walnut, **3667–8.**
**Nux vomica** (*nŭks vŏm'i-kȧ*), poisonous seed of an E. Indian plant, or its extract, **2546,** *picture,* **2855;** contains strychnine and brucine, **3372.**
**Nyasa** (*nyä'sä*), large lake on e. boundary of Nyasaland protectorate; 14,000 sq. mi.; surrounded by mts.; **36;** discovered by Livingstone, **2035.**
**Nya'saland,** Brit. protectorate in e.-cent. Africa; 39,573 sq. mi.; pop. 1,204,000; cotton, tobacco, rubber, coffee; *map,* **40–1.**
**Nye** (*nī*), **Edgar Wilson** ("Bill Nye") (1850–96), Amer. humorous writer and lecturer, b. Shirley, Maine; *picture,* **3021.**
**Nymph** (*nimf*), of insects, **1786.**
**Nymphs,** in Gk. myth., **2546.**
**Nystadt** (*nü'städ*), Finland, small port on Gulf of Bothnia, 40 mi. n.w. of Abo; peace signed between Russia and Sweden (1721), **2747.**

# O

AS far back as we can trace the letter O, it has undergone slight change. Its first appearance seems to be in the Phoenician alphabet as a slightly irregular circle. It was supposed to represent an eye and was called *Ayin*, the Phoenician word for "eye." In the Greek alphabet, as we now have it, there are two characters for this letter, great O (*Omega*, Ω) and little O (*Omicron*, O), but originally there was only one. Such departures from the perfect circle as we find in ancient inscriptions were due to the difficulty of inscribing a circle in stone. Thus sometimes its form is that of an ellipse, sometimes it is square, and sometimes it is nearly a diamond.

**Oahu** (*ō-ä'hụ*), one of Hawaiian Isls.; 598 sq. mi.; **1603, 1602.**

**Oak,** a hardwood tree, **2547–8;** acorns, **3537–8, 2547,** *picture,* **2548;** amount cut in U.S., **3590;** autumn coloration, **3537;** bark used in tanning, **1976;** classified, **3533;** flowers, **3534–5;** gall-nuts, **2548, 1779;** held sacred in primitive faiths, **674, 454;** leaf, **3536;** trunk and branches, **3538–9.**

**Oak, cork, 887–8.**

**Oak, poison, 2852.**

**Oak, "shin" or "chinquapin," 752.**

**Oakland,** Calif., residential and industrial city on San Francisco Bay opposite San Francisco; pop. 216,-261; shipping center for agricultural and fruit-growing region; ships iron and steel products, lumber, engines, canned fruit, and marble; **3124.**

**Oakley, Violet** (born 1874), Amer. mural painter, b. New York City; Harrisburg murals, **1591.**

**Oak Park,** Ill. Residential suburb w. of Chicago, formerly part of town of Cicero; pop. 39,858; incorporated as village 1902.

**Oar-fish,** a large, deep-sea fish with two oarlike fins, **1276.**

**Oasis** (*ō'ā-sis*), fertile spot in a desert, *picture,* **1097;** Libyan desert, **1093;** Sahara, **3104, 33.**

**Oastler, Richard** (1789–1861), Eng. reformer; called "The Factory King" because of energetic advocacy of the factory-workers' cause; work for child labor laws, **729.**

**Oates, Lawrence Edward Grace** (1880–1912), Eng. army officer and polar explorer, **3150.**

**Oates, Titus** (1649–1705). Eng. conspirator, who falsely accused the Catholics of a "popish plot" (1678–80) to restore Catholicism.

**Oatmeal,** how made, **502;** food value, **1321.**

**Oats, 2548–9;** are cultivated grasses, **1502, 1503;** protein content, **2926;** rolled, **502;** rusts and smuts, **3099–3101;** starch content, **3344.**

**Oaxaca** (*wä-hä'kä*) or **Oajaca,** Mexico, state in s. of Isthmus of Tehuantepec, on Pacific; 35,689 sq. mi.; pop. 1,060,000; cap. Oaxaca; coal, **2211.**

**Oaxaca,** Mexico. Commercial and industrial center in beautiful Oaxaca valley, 225 mi. s.e. of Mexico City; pop. 38,000; formerly Huaxyacac, military post of Aztecs.

**Ob** (*ōb*) or **Obi,** great navigable r. of w. Siberia rising in govt. of Tomsk; flows n.w. and n. 2500 mi. to Gulf of Ob, bay of Arctic Ocean; chief tributary, Irtish; **230, 3228.**

**Obadiah** (*ō-bȧ-dī'ȧ*) (6th cent. B.C.), Hebrew minor prophet, author of the 31st book of the Old Testament, which bears his name.

**O'bed,** in Old Testament, son of Ruth and Boaz, **3102.**

**'Obedience',** a Little Talk by Arthur Mee, **2550.**

**Ob'elisk,** a four-sided tapering shaft with a pyramid top; a favorite form of monument of the anc. Egyptians; Cleopatra's Needle, **88,** *picture,* **2493;** of Queen Hatshepsu, **1105.**

**Oberammergau** (*ō-bĕr-äm'-ĕr-gou*), village in Bavaria, Germany, 43 mi. s.w. of Munich; Passion Play, given as thank-offering for deliverance from plague in 1633, **347, 2259.**

**Oberhausen** (*ō'bĕr-hou-zĕn*), Germany. Mfg. town in Rhine Province, Prussia, 35 mi. n. of Cologne; pop. 99,000; iron and chemical works.

**O'berlin,** Ohio. Town 33 mi. s.w. of Cleveland; pop. 4250; Oberlin College.

**Oberlin College,** at Oberlin, Ohio; non-sectarian; co-ed.; founded 1833; arts and science, music, theology; **2572.**

**Oberon** (*ō'bĕr-ŏn*), king of fairies, **1219, 2230.**

**Oberrealschule,** Ger. school, **3140.**

**Objec'tive,** a type of lens; ordinary magnifying glass, **1987,** *pictures,* **1987, 3463;** in microscopes, **2228–9;** in telescopes, **3462–3.**

**Oboe** (*ō'boi*), musical instrument, **3781, 2591,** *picture,* **2382.**

**Obregon** (*ō-brā-gōn'*), **Alvaro** (born 1880), president of Mexico, **2218, 2217.**

**Obrenovitch** (*ō-brā'nō-vich*), ruling Serbian family; held power (not continuously) from accession of Milosh Obrenovitch to assassination of Alexander (1903); **3177.**

**Obser'vatory, 2551–2,** *pictures,* **245, 3463;** spectroscopes, to analyze stars, **3311–4;** telescopes, **3462–3;** transit instrument, *picture,* **3500.**

**Obsid'ian,** a glassy volcanic rock, **1972.**

**Oc'a,** a S. Amer. oxalis, **2607.**

**Ocarina** (*ŏk-ȧ-rē'nȧ*), a musical instrument, **2383,** *picture,* **2382.**

**Occiden'tal College.** At Los Angeles, Calif.; co-ed.; founded 1887 by Presbyterians but now nonsectarian; liberal arts.

**Occulta'tion,** eclipse of one star by another, **1074.**

**Ocean, 2553–9;** affects climate, **794–5, 1188, 2530, 3085;** in Antarctic regions, *picture,* **144;** Arctic, **189;** Atlantic, **254–6;** Baltic Sea, **321;** Black Sea, **434;** bottom forms, **2792;** cables, **556–61;** Caribbean Sea, **644;** contained first life on earth, **1062, 1418, 90–2, 128–30;** continental shelf, **2788, 2558, 2517;** corals, **884–6;** divers and diving, **1014–5,** *picture,* **51;** fogs, **1316;** fossils, **1334,** *picture,* **1335;** greatest depths, **2617, 254, 1763,** *picture,* **51;** Gulf of Mexico, **1548;** Hudson Bay, **1690;** icebergs, **1721–2;** Indian, **1763;** Mediterranean Sea, **2193–4;** mirages, **2261;** mountains, **2358, 644;** North Sea, **2528;** origin, **2788, 2358;** Pacific, **2617–25;** Persian Gulf, **2738;** phosphorescence, **2776;** photography beneath surface, **2778,** *picture,* **2782;** piracy, **2810;** plant and animal life, **2556–8, 396, 644;** plants reproduced in glass, *picture,* **1474;** pressure at different depths, **3696;** Red Sea, **2986;** salt content, **2554;** saltness a basis for calculating earth's age, **1060;** sea-level changes, **1420;** storms, **3366–7;** tides, **3496–8;** waterspouts, **3700–1;** waves, **3705–6;** winds, **3750–1.** *See also in Index* **Explorers and explorations; Navigation;** and the principal topics above by name.

**Ocean currents, 2558–9;** Antarctic, **1078;** Atlantic, **255;** Gulf Stream, **1549, 255, 2558;** Japan, **2558, 77, 581;** Labrador, **255, 1549, 1316, 1948.**

**Ocean Grove,** N.J., town on Atlantic 6 mi. s. of Long Branch; summer pop. 20,000 to 30,000; controlled by Ocean Grove Camp Meeting Association of Meth. Episc. church; **2458.**

**Ocean'ia** or **Oceanica,** isls. of Pacific Ocean divided into Polynesia, Micronesia, Melanesia, **2619–25,** *map,* **2624–5.** *See also in Index* chief islands and groups by name.

**Ocean'ic climate, 794–5, 2558–9, 1188.**

**Oceanides** (*ō-sē-ăn'ī-dēz*), in Gk. myth., ocean nymphs, **2546.**

**Oceanog'raphy,** the science of ocean phenomena, **2787;** includes hydrographic surveying, **3398.**

**Ocean Springs,** Miss., resort on Bay of Biloxi, inlet of Gulf of Mexico, 5 mi. e. of Biloxi; pop. 1732; **2264.**

**Oceanus** (*ō-sē'ȧ-nŭs*), in Gk. myth., eldest of the Titans, personification of the all-encircling ocean, **2546.**

**Ocelli** (*ō-sĕl'ī*), "simple" eyes of insects, **1787.**

**Ocelot** (*ō'sē-lŏt*), a leopard-like cat, **1989.**

**Ochre** (*ō'kēr*), a mineral consisting of clay colored with some oxide of iron, the depth of color being dependent on proportion of iron; in paint, **2642.**

**Ocmulgee** (*ŏk-mŭl'gē*), river rising in n.-cent. Georgia; flows 260 mi. s.e., joining Oconee to form Altamaha; **1432.**

**O'Connell, Daniel** (1775–1847), Irish lawyer and political leader, **2559.**

**O'Connell, William Henry** (born 1859). American Rom. Cath. prelate, b. Lowell, Mass.; archbishop of Boston 1907; cardinal 1911.

**O'Connor, Andrew** (born 1874), Amer. sculptor, b. Worcester, Mass.; statues and bas-reliefs in marble and bronze (porch of St. Bartholomew's Church, New York; bas-relief in library of J.P. Morgan, etc.); **3164.**

**O'Connor, Thomas Power** ("Tay Pay") (born 1848). Irish Nation-

alist leader; founded and edited *T.P.'S Weekly;* in House of Commons after 1880.
**Octave** (*ŏk'tăv*), in music, the 8th full tone above or below any given note; also the interval between a note and its octave; **3278.**
**Octavia** (*ŏk-tā'vĭ-ȧ*) (d. 11 B.C.). Sister of the Roman emperor Augustus, and faithful wife of Mark Antony; deserted by him for Cleopatra.
**Octavia** (42–62 A.D.), Rom. empress, wife of Nero, **2436.**
**Octa'vian** (originally Gaius Octavius), family name of Augustus Caesar, **257–8.**
**Octa'vo,** a book size, **458.**
**Octo'ber,** 10th month of calendar year, **2559;** birthday stone, **1409.**
**Oc'topus, 2559, 943–4;** a cephalopod mollusk, **2280;** clustered eggs, **1090;** evolutionary position, **128;** rudimentary skeleton, **3244.**
**Oc'ulist,** work of, **3310.**
**Ode** (*ōd*), a form of stately and elaborate lyric poetry; originally a poem intended to be chanted or sung; Dryden, **1043;** Horace, **1967;** Keats, **1914;** Pindar, **1536.**
**Odena'thus** (d. 271 or 266 A.D.), general and ruler of Palmyra; husband of Queen Zenobia; **2648.**
**Odense** (*ō'thĕn-sā*), 3d city in Denmark, on isl. of Fünen at mouth of Odense R.; pop. 45,000; splendid cathedral; industrial and commercial center; **996.**
**'Ode on a Grecian Urn',** poem by Keats, **1914.**
**Oder** (*ō'dĕr*), important r. of Germany; rises in n.-cent. Czecho-Slovakia, flows n.e. 560 mi. and enters Baltic by 3 arms after widening to form Stettiner Haff; internationalized by Versailles Treaty to give Czecho-Slovakia access to sea; **1439.**
**Odes'sa,** seaport of Ukraine on Black Sea; pop. 650,000; **2560;** grain trade, **3086.**
**O'din** or **Woden,** in Norse myth., father of gods, **2560, 3135, 969, 996, 2504,** *picture,* **2561.**
**O'do** (Fr. *Eudes*) (d. 898), king of the Franks, crowned 888 after deposition of Charles the Fat; son of Robert the Strong; fought Normans and his rival Charles III for Fr. throne; defense of Paris, **2526.**
**Odoacer** (*ō-dō-ā'sẽr*) (434?–493), Ger. leader who overthrew the Western Roman Empire in 476, **3048, 1491, 1842.**
**Odona'ta,** dragon-fly order of insects, **1788, 1030, 3946.**
**Odontoglos'sae,** flamingo order of birds, **412,** *picture,* **414.**
**Odysseus** (*ō-dĭs'ūs*), in Gk. myth., king of Ithaca and Trojan War hero, **2562–6;** aided by Aeolus, **29–30;** combat with Ajax, **69;** in Homer's 'Odyssey', **1676;** palace, **1520;** summons Achilles to war, **8.** —*Stories:* 'Homer's Story of Odysseus and Circe', **767–8;** 'How Odysseus and His Men Outwitted the Cyclops', **944–5;** 'Some Adventures of the Great-Hearted Odysseus', **2562–6;** 'The Story of the Wooden Horse', **3543–4.**
**'Odyssey'** (*ŏd'ĭ-sĭ*), Gk. epic poem relating adventures of Odysseus on return from Trojan War, **1675–6;** Latin translations, **1966;** place in literature, **1535.** *See also in Index* **Homer.**
**Oedipus** (*ĕd'ĭ-pŭs*), in Gk. myth., king of Thebes, whose tragic fate formed subject of many dramas, **2566, 1536,** *picture,* **1535.**
**Oenone** (*ē-nō'nē*), in Gk. myth., river-nymph, wife of Paris, **2680.** Story told in Tennyson's 'Oenone'.
**Oersted** (*ûr'stĕd*) or **Orsted, Hans Christian** (1777–1851), Danish physicist, established connection between electricity and magnetism, **1121.**
**Oesophagus** (*ē-sŏf'ȧ-gŭs*), or gullet, muscular tube from mouth to stomach, **3360, 1011;** in pouter pigeons, **2804.**
**Of'fa** (d. 796). King of Mercia; defeated Wessex and the Welsh, wresting part of territory from the latter and building great fortifications along whole border between England and Wales known as "Offa's Dyke."
**Offenbach** (*ŏf'ĕn-bäk*), **Jacques** (1819–80). Fr. composer, originator of opera bouffe, b. Germany ('Tales of Hoffman').
**Officers of U.S. Army, 218;** Military Academy, **2236–8;** uniforms and insignia, **3578,** *picture,* **3576.**
**Officers of U.S. Navy, 2426;** Naval Academy, **2418–9;** uniforms and insignia, **3578–9,** *picture,* **3577.**
**Off-set process,** in lithography, **1172.**
**Ogdai Khan** (d. 1241), Mongol emperor; conquests, **2285.**
**Og'den, Peter Skene** (1794–1854), Brit.-Amer. fur trader; in employ of Hudson's Bay Co. explored much new territory; Ogden, Utah, named for him; crosses Nevada, **2446.**
**Ogden,** Utah, mfg. city in agricultural and mining region, 34 mi. n. of Salt Lake City on Weber and Ogden rivers; pop. 32,804; **3612.**
**Ogdensburg,** N.Y. Port on St. Lawrence R., at foot of deep-water navigation of Great Lakes; pop. 14,609; trade in lumber, grain, and coal; silk, brass goods, gloves, lumber, wood pulp.
**Ogeechee** (*ō-ĝē'chē*) **River,** in Georgia, 250 mi. to Ossabaw Sound, *map,* **1432.**
**Oglethorpe** (*ō'gl-thôrp*), **James Edward** (1696–1785), Eng. general and philanthropist, founder of Georgia, **1434, 3130, 3602;** prohibits slave and liquor traffic, **2920.**
**Oglethorpe University.** At Atlanta, Ga.; co-ed., Presb. directorate; successor to former Oglethorpe Univ. established 1835, one of best known in South, which flourished until Civil War and closed 1872.
**Ogygia** (*ō-ĝĭ-ĝĭ'ĭ-ȧ*), in Gk. myth., the isl. of Calypso, **2563.**
**O. Henry,** pen name of William Sydney Porter (1862–1910), Amer. short-story writer, **2884–5.**
**O'Higgins, Bernardo** (1778–1842), Chilean patriot and dictator, leader in war for independence; head (1818–23) of first national govt., **738.**
**Ohi'o,** a n.-cent. state of U.S.; 41,040 sq. mi.; pop. 5,759,394; **2567–72,** *maps,* **2568, 3584–5;** agriculture, **2570–1, 970, 1609, 1671, 3509;** cap. Columbus, **849;** cities and mfrs., **2570, 69, 766, 792–3, 970, 3511–2;** education, **2572;** famous citizens, **2572, 2567, 793;** glacial history, **2571;** L. Erie, **1174;** meaning of name, **3347;** minerals, **2570, 676, 1407, 1408;** Ohio R., **2572–3;** population, **2567, 2568, 2572;** state flower, **3347;** surface, **2571–2;** travel routes and transportation, **2567–8, 2570, 2571.** —*History,* **2572, 2567–8, 2573;** Clark expedition, **788;** Western Reserve, **867, 869;** in Northwest Territory, **2529;** development of Cincinnati, **766;** Cleveland settled, **793;** boundary dispute with Michigan, **2223;** Ohio and Erie Canal, **793, 2568;** famous governors, **2104, 1610.**
**Ohio and Erie Canal,** between Portsmouth and Cleveland, Ohio, **2568, 2572.**
**Ohio Company of Associates,** company formed by New England colonists (1786) for purchase and settlement of w. lands; large tracts in s. Ohio purchased from Congress; Marietta founded (1788), **2572.**
**Ohio River, 2572–3, 1757;** commerce, **2568, 2570, 2721, 766, 2812–3;** La Salle discovers, **1964;** early navigation, **2073, 1759;** influence on settlement, **1758, 3581.**
**Ohio State University,** at Columbus, Ohio; co-ed. state institution; founded 1870; colleges of agriculture, arts, philosophy and science, education, engineering, law, pharmacy, veterinary medicine; **849,** *picture,* **2570.**
**Ohio University,** at Athens, Ohio; co-ed. state institution; opened 1808 (chartered 1804); colleges of liberal arts, music, oratory, state normal college, school of commerce, engineering depts.; **2572.**
**Ohio Wesleyan University.** At Delaware, Ohio; co-ed., Meth. Episc.; opened 1844 (chartered 1842); liberal arts, music and fine arts.
**Ohm** (*ōm*), **George Simon** (1787–1854), Ger. mathematician and physicist; "ohm," unit of electrical resistance, named for him; discovered "Ohm's law," **1120.**
**Ohm,** unit of resistance to electricity, **1116.**
**Ohm's law,** for measuring electric current, **1120, 1116.**
**Oil-beetles,** types which exude blistering oil when alarmed, **371, 370.**
**Oil-cake,** seeds from which oil has been pressed, **1227;** corn, **890;** cottonseed, **902;** flax, **1291;** S. Carolina, **3291;** soy bean, **3297.**
**Oil City,** Pa., on Allegheny R. about 60 mi. s.e. of Erie, one of largest oil markets of Pennsylvania petroleum fields; pop. 21,274; **2721.**
**Oilcloth, 2018.**
**Oil of vitriol.** Same as **Sulphuric acid.**
**Oil painting,** process discovered, **2629;** paints used, **2642–3.** *See also in Index* **Painting.**
**Oils, 1225–7;** in butter substitutes, **2577–9;** from coal-tar, **814;** combustion, **1619;** in digestion, **1011;** essential, **2728, 1225;** lighting, **1959;** mineral (petroleum), **2749–55;** in paints and varnishes, **2642–3, 3619;** in soaps, **3263, 3267;** spices, **3318.** *See also in Index* **Fats; Petroleum.**
**"Oil springs," 2750.**
**Oil varnishes, 2643.**
**Oise** (*wäz*), r. of n. France; rises in s.w. Belgium; flows s.w., receiving Aisne at Compiègne, and joins Seine 15 mi. n.w. of Paris; length 187 mi.; important strategic line in World War; *map,* **1351.**
**Ojib'wa** or **Chippewa Indians,** large and important Algonquian tribe once living about upper Great Lakes and extending w. into Minnesota, **1767;** treaties with, **2257.**
**Okano'gan** or **Okan'agan,** a lake in s. British Columbia, 60 mi. long, *map,* **602–3.**
**Okanogan Highlands, 3686.**
**Okanogan River,** a tributary of the Columbia in British Columbia and Washington, rising in L. Okawogus; 300 mi. long; *map,* **3687.**
**Okapi** (*ō-kä'pĭ*), a giraffe-like animal, **1464, 34.**
**Oka** (*ō-kä'*) **River,** in cent. Russia; though rapid, is navigable for almost entire length of 950 mi.; joins Volga, **3660.**
**Okecho'bee,** lake in Fla. 40 mi. long, 25 mi. wide, **1298, 1300,** *map,* **1297.**
**Okefenokee** (*ō-kĕ-fĭ-nō'kē*) or **Okefinokee Swamp,** in Ga. and Fla., **1431,** *picture,* **1433,** *map,* **1432.**
**Okhotsk** (*ō-kŏtsk'*), **Sea of, 2619, 228, 1907,** *map,* **232–3;** fur seals, **3167.**
**Oklahoma** (*ō-klȧ-hō'mȧ*), state of s.-cent. U.S.; 70,057 sq. mi.; pop. 2,028,283; **2573–7,** *maps,* **2574, 3584–5;** agricultural and mineral products, **2576;** cap. Oklahoma City, **2577;** natural gas, **2576, 1408;** helium, **1629;** Indian Reservations, **2576;** meaning of name, **3347;** petroleum; **2576, 2574, 2754, 1408;** Platt Park, **2400;** state flower, **3347;** topography, **2576.**

**Oklahoma, University of,** at Norman, Okla.; co-ed., state institution; founded 1892; colleges of arts and science, engineering, schools of medicine, law; **2577.**
**Oklahoma Agricultural and Mechanical College.** At Stillwater, Okla.; co-ed. state institution; founded 1891; agriculturc, mechanical arts, engineering, military sciencc, domestic science.
**Oklahoma City,** Okla., state cap.; pop. 91,295; **2577;** capitol building, *picture*, **2574.**
**Oklahoma College for Women.** State institution at Chickasha, Okla.; founded 1908; arts and science.
**Okmul'gee,** Okla., city 40 mi. s. of Tulsa in rich coal, oil, and gas region; pop. 17,430; glass, iron products. cotton and cotton-seed oils; **2576.**
**O'kra** or **gumbo,** an annual flowering plant of the hibiscus genus; native of W. Indies but extensively cultivated in s. U.S.; when and how to plant, **1397.**
**Okubo** (*ō'kụ-bō*), **Toshimitsu** (1830–78). One of 5 great Japanese nobles who led revolution (1868) against shogunate; until his death one of the mikado's chief advisers.
**Okuma** (*ō'kụ-mä*), **Shigenobu, Marquis** (1838–1922). Organizer and leader of progressive party in Japan; early advocate of abolition of feudal system and advance reforms, founder of Japanese Women's Univ.; premier in 1895, 1898, 1914–16.
**Olaf** (*ō'läf*) **I, Tryggvesson** (969–1000). King of Norway; began christianization of Norway; leaped into sea after defeat by Danes and Swedes; heroic deeds recounted in Longfellow's 'Saga of King Olaf'.
**Olaf II, Saint** (995–1030). King and patron saint of Norway, conquered throne 1016; unified kingdom and continued its Christianization.
**Oland** (*ē'länt*), Swedish isl. in Baltic Sea across Kalmar Sound from s.e. extremity of Sweden; 519 sq. mi.; pop. 130,000; only town Borgholm on w. coast; **3402.**
**'"Old Abe," the War Eagle',** story, **1055–6.**
**Old age pensions, 2722;** in Australia, **267;** England, **2039, 2722;** Germany, **1449;** New Zealand, **2500.**
**Old Bay State, 2164.**
**Old Castile,** Spain; n. part of Castile, an elevated plateau walled in by mountains; *map*, **3300.**
**Old Dominion, 3647.**
**Olden Barneveldt.** *See in Index* **Barneveldt.**
**Oldenburg** (*ōld'ēn-bụrĸ*). Republic (former grand duchy) of n.w. Germany on North Sea; includes republics of Birkenfeld and Lübeck; 2482 sq. mi.; pop. 518,000; cap. Oldenburg (pop. 30,000).
**Old English** or **Anglo-Saxon** language, **1162, 1163.**
**Old Faithful,** geyser in Yellowstone National Park, **3829,** *picture,* **3819.**
**Old Forge,** Pa. Coal-mining borough on Lackawanna R., 4 mi. s.w. of Scranton; pop. 12,237; silk mfrs.
**"Old Fuss and Feathers," 3153.**
**Old Granary Burial Ground,** in Boston, **470.**
**Old Guard.** Popular name of noted body of troops in army of Napoleon I; made last Fr. charge at battle of Waterloo.
**Oldham** (*ōld'ŭm*), England, important cotton mfg. town in Lancashire 6 mi. n.e. of Manchester; pop. 143,000; coal mines; **1158.**
**"Old Hickory," 1855.**
**Old Hunkers, 2871.**
**"Old Ironsides,"** nickname of U.S. frigatc *Constitution*, *picture*, **2423.**
**'Old Ironsides',** poem by Holmes, **1674;** quoted, **2423.**
**"Old King Cole,"** origin, **2340.**
**"Old Lady of Threadneedle Street," 2051.**
**Old Line State, 3347.**
**"Old Man Eloquent," 16.**
**Old Man of the Mountain, 236.**
**Old Man of the Sea.** In 'Arabian Nights', the little old man who begs Sinbad the Sailor to carry him across a brook and then will not be dislodged from his back; hencc, a bore or burden.
**Old Manse,** in Concord, Mass., home of Emerson and Hawthorne, **856, 1607.**
**Old North Church** (Christ Church), Boston, **472,** *picture,* **471.**
**Old North State, 2517.**
**Old Point Comfort,** Va. Summer resort at mouth of James R. 14 mi. n. of Norfolk.
**Old Pretender, 2914.**
**Old Régime,** in France, **1352, 1366.**
**"Old Rough and Ready," 3444.**
**"Old Salamander," 1225.**
**Old Sarum** (*sā'rŭm*), parish in Wiltshire, England, 2 mi. n. of Salisbury; former city, deserted by 16th cent., sent members to Parliament until 1832; proverbial "rotten borough"; **700.**
**Old South Church,** in Boston, **472.**
**Old State House,** Boston, **472,** *picture*, **471.**
**Old Testament,** division of the Bible, **388, 390;** divisions, **2923;** language, **1624, 1625.**
**"Old Tippecanoe," 1594.**
**Old Trails Road, 3024.**
**Oleaceae** (*ō-lē-ā'sē-ē*), or olive family, plant family including olives and lilacs, **3943.**
**Olean** (*ō-lē-ăn'*), N.Y. Distributing point for Pennsylvania petroleum; on Allegheny R. 60 mi. s. of Buffalo; pop. 20,506; lumber mills, tanneries, oil refineries.
**Olean'der,** a flowering shrub, **2577.**
**Ole'ic acid, 1227.**
**Olein** (*ō'lē-ĭn*), compound found in fats and oils, **1227.**
**Oleomargarine** (*ō-lē-ō-mär'ĝà-rĭn*), artificial butter, **2577–9.**
**O'leo oil, 2577.**
**Oléron** (*ō-lā-rôṅ'*). Fertile isl. off w. coast of France at mouth of Charente R.; included in dept. of Charente-Inferieure; 66 sq. mi.; chief town St. Pierre.
**Olfac'tory nerve, 2437.**
**Oligarchy** (*ŏl'i-ĝär-ki*), form of govt. in which power is held by small group; anc. Greece, **1521.**
**Ol'igocene period,** in geology, **1418,** *picture,* **1419.**
**Oliphant** (*ŏl'i-fănt*), **Mrs. Margaret Wilson** (1828–97). Scotch novelist and historical writer ('Chronicles of Carringford'; 'Makers of Venice').
**Oliphant,** Roland's horn, **3038.**
**Olive, 2579–80;** California production, **582;** classified, **3533;** fruit and branch, *picture*, **1226;** grove in Spain, *picture,* **3302.**
**Olive family.** Same as **Oleaceae.**
**Olive oil, 1227, 2580;** food value, **1320, 1321;** freezing point, **1362.**
**Oliver, James** (1823–1908), Amer. inventor and manufacturer, b. Scotland; revolutionizes plowmaking, **2839.**
**'Oliver Twist'.** Novel by Dickens; relates adventures of orphan who infringes workhouse etiquette by asking for more gruel; runs away and becomes innocent pupil of Fagin the pickpocket and tool of Bill Sikes the burglar.
**Olives, Mount of,** historic ridge e. of Jerusalem; favorite resort of Christ and Disciples; contains "Hill of Offense," reputed scene of Solomon's idolatry; alluded to in Old and New Testaments; **1885, 1886.**
**Ol'ivet,** Mich. Seat of Olivet College. 15 mi. n.e. of Battle Creek; pop. 500.
**Olivet College.** At Olivet, Mich.: co-ed.; foundcd 1844, chartered as college 1859; non-sect. but allied with Congregationalists; arts and science, pedagogy, biology, music.
**Oliv'ia.** Countess beloved by the duke in Shakespeare's 'Twelfth Night'.
**Ollivant, Alfred** (born 1874), Eng. novelist; author of 'Bob, Son of Battle', **1020.**
**Olmsted** (*ŏm'stĕd*), **Frederick Law** (1822–1903). Pioneer Amcr. landscape architect, b. Hartford, Conn.; designer of Central Park, New York City, Fairmont Park, Philadelphia, Franklin Park, Boston, etc.; originator of school of landscape gardening which emphasizes natural features, avoiding formal European styles.
**Olmütz** (*ōl'mŭts*) or **Olomouc,** Czecho-Slovakia. Moravian town on March R. 100 mi. n. of Pressburg; coal mining; pop. 51,000; occupied by Swedes in Thirty Years' War; besieged by Frederick the Great (1758); conference to settle Prussian affairs (1850).
**Olney, Richard** (1835–1917), Amer. jurist and statesman, b. Oxford, Mass.; atty.-gen. (1893–95) and sec. of state (1895–97) under Cleveland; used injunction in r.r. strike of 1894—first case of govt. by injunction in strike; defines Monroe Doctrine, **2307.**
**Oltenitza** (*ōl-tā-nĕt'sä*), Rumania. Town on Danube R. 35 mi. s.e. of Bucharest; Turks defeated Russians in Crimean War; large grain and lumber trade.
**Olus'tee,** Fla. Village 46 mi. s.w. of Jacksonville; battle of Olustee or Ocean Pond (Feb. 20, 1864), one of bloodiest battles of Civil War, resulting in Federal defeat.
**Olym'pia,** Greece, plain in anc. Elis on Alpheus R. (modern Ruphia); adorned by beautiful temples and statues; scene of Olympic games, **2580;** excavations at, **1527–8;** temple and statue of Zeus, **3178, 1530,** *picture,* **3179.**
**Olympia,** Wash., state cap., at head of Puget Sound; pop. 7795; ships oysters, lumber, fruit; abundant water-power; lumber and veneers, canned goods, iron and dairy products; capitol, *picture,* **3688.**
**Olym'piad,** interval of 4 years between celebrations of Olympic Games, used by Greeks for reckoning time, **2580.**
**Olym'pias** (d. 316 B.C.). Fierce ambitious Epirote princess, wife of Philip II of Macedon and mother of Alexander the Great.
**'Olympic',** ocean liner, **3214,** *picture,* **3215;** compared with *Santa Maria,* **3207.**
**Olympic Games,** anc., **2580–1;** modern, **252, 2144.**
**Olympic Mts.,** in Wash., n. group of Cascade range, between Puget Sound and Pacific, **3686.**
**Olympium** (*ō-lĭm'pĭ-ŭm*), temple of Olympian Zeus, **249.**
**Olym'pus, Mt.,** ridge in n. Greece, separating Thessaly and Macedonia, **1517,** *map,* **1518;** fabled home of gods, **3838, 1639.** Name also applied in anc. times to several other peaks, especially one in Asia Minor.
**Ol'yphant,** Pa. Coal-mining town on Lackawanna R. 5 mi. n.w. of Scranton; pop. 10,236; blasting powder, machinery, iron products.
**Omaha** (*ō'mȧ-hą*), Neb., largest city of state; pop. 191,601; **2581, 2432.**
**Omahas,** tribe of Plains Indians formerly living between Platte and Niobrara rivers in Nebraska, **1767, 2581.**
**Oman** (*ō-män'*), independent state of s.e. Arabia on Persian Gulf, Gulf of Oman, and Arabian Sea;

82,000 sq. mi.; pop. 500,000, chiefly Arabs; exports dates; cap. Muskat (or Maskat); **167,** *maps,* **165, 232–3.**

**Oman, Gulf of,** arm of Arabian Sea s. of Persia; connected with Persian Gulf by Strait of Ormuz, **2738.**

**Omar** (*ō'mär*) (581?–644), 2d Mohammedan calif, organizer of Mohammedan power from warring sect to conquering nation and empire; founds Cairo, **566.**

**Omar, Mosque of,** Jerusalem, built over rock supposed by Jews to be scene of the sacrifice of Isaac and, by Mohammedans, of the Prophet's ascension, **1885.**

**Omar Khayyam** (*kī-yäm'*) (d. 1123?), Persian mathematician, astronomer, and poet, **2738.**

**Omdurman** (*ŏm-dụr-män'*), Anglo-Egyptian Sudan, city on Nile R. opposite Khartum; pop. 85,000; ivory, ostrich feathers, gum arabic; **1093;** captured by Kitchener, **1929.**

**Ommiads** (*ŏ-mī'ădz*), **Omayyads,** or **Umayyads.** Dynasty of califs or successors of Mohammed who asserted rule over Mohammedan empire from death of Ali, 4th calif, to rise of Abbasids (661–750), and ruled in Spain (756–1031).

**Omsk,** distributing point for w. Siberia, on Irtish R. and Trans-Siberian Ry., 280 mi. s.e. of Tobolsk; pop. 135,000; seat of unsuccessful anti-Bolshevik govt. established by former Kerensky supporters, headed by Gen. Kolchak; **3229.**

**Onager** (*ŏn'ȧ-ġēr*), a wild ass, **235.**

**Oñate** (*ōn-yä'tā*), **Juan de** (1555–1615?), Span. explorer and colonizer of New Mexico; founds Santa Fe, **2467.**

**One'ga, Lake.** In n.w. Russia, 2d largest lake in Europe; 3700 sq. mi.; indented, rocky shores; outlet to White Sea, canal connection with Volga and Dvina; fisheries, timber trade.

**Oneida** (*ō-nī'dȧ*), N.Y. City 25 mi. e. of Syracuse; near Oneida L.; pop. 10,541; lumber products, knit goods.

**Oneida, Lake,** N.Y., **2482,** *map,* **2480.**

**Oneida Community.** Communistic religious settlement founded by John H. Noyes, 1838, and established near Oneida, N.Y., 1847–48; dissolved 1879, and reorganized into a joint stock company; makes hardware, steel traps, silverware, etc. in plants at Kenwood, N.Y., Niagara Falls, N.Y., and Niagara Falls, Ont.

**Oneidas,** tribe of Iroquois Indians formerly living about Oneida Lake, N.Y., and s. to Susquehanna R., **1766.**

**Oneon'ta,** N.Y. Market for dairy products, on Susquehanna R. about 65 mi. s.w. of Albany; pop. 11,582; r.r. shops; overalls, gloves, silk.

**On'ion,** a biennial food plant, **2581;** bulb structure, **532;** odor, **3389;** when and how to plant, **1397;** contains vitamins, **3652.**

**On'nes, Heike Kamerlingh** (born 1853), Dutch physicist, winner of Nobel prize for physics 1913; low temperature experiments, **1618.**

**Onondagas** (*ŏn-ŏn-dą'ġȧs*), Indian tribe of Iroquois group formerly living about L. Onondaga, N.Y., **1766, 3425.**

**Onta'rio,** Canada, a cent. province of Canada; 407,270 sq. mi.; pop. 2,600,000; cap. Toronto; **2582–3,** *map,* **602–3;** Algonquin Park, **2400;** cities and manufactures, **2582, 1333, 1569, 1926, 2057, 2604, 3516–7;** education, **622;** Georgian Bay, **1705;** Great Lakes, **1510–4;** history, **2583, 3672, 2102;** Laurentian Plateau, **1970;** minerals, **2582–3, 1142, 3242;** Niagara Falls, **2501–4;** St. Lawrence R., **3107–9;** Sault Sainte Marie, **3129–30;** Welland Canal, **3716.**

**Ontario, Lake,** smallest of Great Lakes; 7260 sq. mi.; **2583, 1510–4,** *map,* **1511;** Welland Canal, **3716.**

**Ontario Agricultural College.** At Guelph, Ontario; founded 1874; agriculture, manual training; affiliated Macdonald Institute offers home economics courses for women.

**'On the Bridge of Avignon',** Fr. folksong, **1318.**

**On'yx,** a form of quartz in colored layers, **1409, 1411, 2945;** silica base, **3233.**

**Onyx marble, 2144.**

**Oölitic** (*ō-ō-lĭt'ĭk*) **limestone, 2010;** Indiana (Bedford) quarries, **2945,** *picture,* **1761.**

**Oölitic period,** in geology, *picture,* **1419.**

**Oolong** (*o͞o'lông*), a dark Formosan tea, **3450.**

**Oo'miak,** Eskimo boat, **445.**

**O'ospore,** fertilized egg-cell in primitive plants, **3173.**

**Ooze,** slimy mud on sea bottom, **396, 2558.**

**Ooze or suede leather, 1977.**

**O'pal,** a precious stone, **1409, 1410–1;** silica base, **3233.**

**Opava.** *See in Index* **Troppau.**

**Open-cut tunnels, 3551.**

**Open door policy,** term used in international politics to designate equality of commercial opportunity to all nations; in China, **3606.**

**Open-hearth process** of steel manufacture, **1826.**

**Open shop.** An industrial establishment which employs both union and non-union labor.

**Opequon** (*ō-pĕk'ŏn*) **Creek.** Near Winchester, Va., Civil War battle (also called battle of Winchester), Sept. 19, 1864; Federals under Sheridan defeated Confederates under Early. *See in Index* **Winchester.**

**Opera** (*ŏp'ĕr-ȧ*), **2584, 2380;** Wagner's influence, **3663.**

**Opéra,** theater in Paris, *picture,* **2683.**

**Opera glass, 3463.**

**Operations, surgical, 2193;** use of anesthetics, **124–5.**

**Ophelia** (*ō-fē'lī-ȧ*), in Shakespeare's 'Hamlet', daughter of Polonius, beloved by Hamlet, **1570.**

**Ophelia rose,** *picture,* **3067.**

**Ophid'ia,** the snake order of reptiles, **3261, 2038.**

**Ophir** (*ō'fẽr*), anc. land mentioned in Bible, **3274.**

**Opiates** (*ō'pī-ātz*), **2585.**

**O'pitz, Martin** (1597–1639). Ger. poet; head of so-called First Silesian School; called "father of modern German poetry."

**O'pium, 2584–5, 2880;** antidote, **1270, 2855;** chemical properties, **10;** trade in China, **748, 2585.**

**Opium poppy, 2880.**

**Opium War** (1840–42), **2585;** Hongkong ceded to Gt. Brit., **1679.**

**Oporto** (*ō-pōr'tō*), 2d city of Portugal, scaport and commercial center on Douro R., 2 mi. from sea; pop. 195,000; textiles, port wine; **2888.**

**Opos'sum** (Amer.), **2585, 1908;** evolutionary position, **128;** fur, **1390.**

**Opossum** (Australia), *picture,* **266.**

**Ops** (*ŏps*), in Rom. myth., goddess of plenty, **3129.**

**Op'sonin,** germ-fighting substance in the blood, *picture,* **1451.**

**Optic, Oliver.** Pen name of William Taylor Adams (1822–97), author of boys' books; b. Medway, Mass. ('Young America Abroad'; 'Starry Flag Series').

**Op'tical center,** of lens, **1987.**

**Optical glass,** any kind used in optical instruments, **1474;** center of U.S. industry, **3033.** *See in Index* **Glass.**

**Optical illusions.** *See in Index* **Illusions.**

**Optical instruments,** lenses, **1986-8;** microscope, **2228–30;** polariscopes, **2000;** spectroscopes, **3312–4;** telescopes and field glasses, **3462–3.**

**Optic nerve, 1213–4,** *picture,* **1216;** grows inward toward brain, **2437.**

**Op'tics,** the science of light, **2786.** *See also in Index* **Light.**

**'Optimism',** a Little Talk by Arthur Mee, **2586–7,** *picture,* frontispiece, Vol. 5.

**Opuntia** (*ō-pŭn'shĭ-ȧ*), a genus of cacti, **562.**

**Or,** in heraldry, **1639.**

**Oracle** (*ŏr'ȧ-kl*), **Delphic, 991, 156;** responses of, **11, 563, 923, 2086, 3487.**

**Oracle of Zeus,** at Dodona, **991.**

**Oradea Mare.** *See in Index* **Nagy-Varad.**

**Oran** (*ō-răn'*), Algeria, prosperous city on n. coast of Africa, 230 mi. s.w. of Algiers; pop. 123,000; exports cereals, olives, wine, tobacco, hides, and cattle; **97.**

**Orange,** principality in s. France; fell to House of Nassau in 1531, under Nassau-Orange family until 1702, annexed to France in 1714; **3741.**

**Orange,** Conn. Mfg. town 6 mi. s.w. of New Haven; trade center for productive agricultural region; pop. 16,614.

**Orange,** N.J., residential and mfg. suburb 12 mi. w. of New York City; pop. 33,268; Orange, East Orange, West Orange, and South Orange form "the Oranges"; Edison plant, **1084;** hats, **1597.**

**Orange, Fort.** *See in Index* **Fort Orange.**

**Orange, House of,** princely family whose heads were sovereigns of Orange (s.e. France); also held large possessions in the Netherlands and thus became defenders of Dutch liberty against Span. oppression, and ancestors of present Dutch royal line; **2442;** William the Silent, **3741;** William III of England, **3740–1.**

**Orange,** a citrus fruit, **2588–90,** *pictures,* **2588, 2589, 1377, 1226;** California production, **2588, 582;** citric acid, **10;** in Florida, **1296, 1297;** introduced into Europe, **932;** old trees at Versailles, **3633;** in Paraguay, **2677;** seedless, **2588, 495;** vitamins, **3652.**

**Orange,** a secondary color, **837;** position in spectrum, *diagram,* **5311.**

**Orange, osage.** *See in Index* **Osage orange.**

**Orange Free State,** Brit. colony in S. Africa; 50,389 sq. mi.; pop. 550,000; **2590,** *maps,* **3282, 40–1;** Boer War, **3282–3, 446–7;** diamond fields, **3281.**

**Orange Lake,** in n. Florida, about 14 mi. long; ibis breeding grounds, **3364.**

**Orangemen,** members of Orange Society of Irish Protestants (essentially political) originating in Ulster; name derived from King William III (Prince of Orange); **1810.**

**"Orange-peel" dredge, 1040.**

**Orange pekoe tea,** *picture,* **3446.**

**Orange River,** large r. in S. Africa; flows 1100 mi. into Atlantic; **36, 2590, 1001,** *maps,* **3282, 40–1.**

**Orang'-utan,** an anthropoid ape, **2590, 153, 154;** altitude range, *picture,* **397;** evolutionary position, **128;** hand, *picture,* **153.**

**Orato'rio,** dramatic composition for voices, **2378;** developed by Handel, **1572, 1574.**

**Or'atory, 3004–5;** American, **112;** Greek, **1537;** Roman, **1966.** *See in Index* names of great orators.

**Or'bit,** path of heavenly body; of comets, **850;** earth, **242, 1063;** Eros and Mars, **238;** planets, **1921.**

**Orchard,** management of, **1378–80.** *See also in Index* names of fruits.

**Orchard oriole, 2601.**

**Orchestra** (*ôr'kĕs-trȧ*), **2590–3;** musical instruments, **2381–3.**

**Orchestra,** part of theater, **3484.**
**Orchid** (*ôr'kid*), family of flowering plants, **2592–3;** lady's slipper, **1955;** in India, **1748;** vanilla-producing types, **3619.**
**Orchidaceae** (*ôr-ki-dā'sē-ē*) or **orchid family, 2593, 3940.**
**Orchomenus** (*ôr-kŏm'ē-nŭs*). Anc. Gk. city in Boeotia; great continental and maritime power in prehistoric times, cap. of the Minyae; superseded by Thebes.
**Or'deal,** trial by, **1905.**
**Order,** division of a class of living organisms; bird orders, **412.**
**Order in Council,** in Gt. Brit., any order issued by the sovereign on advice of the privy council; in Napoleonic wars, **3670, 3671.**
**Orders, religious, 2298–2302.** *See in Index* names of various orders.
**Orders of architecture,** Greek, **177,** *picture,* **180.**
**Orders of knighthood, 979, 1934–5.**
**Or'dinal numbers, 643.**
**Or'dinance of 1787,** U.S., **2529, 2227, 1882.**
**Ordinances of Justice,** in Florence, **1293.**
**Ordina'tion of clergy, 764.**
**Ord'nance,** heavy firearms, such as mortars and cannon. *See in Index* **Cannon.**
**Ordnance Department,** U. S. Army, **217, 3599;** insignia, **3578,** *picture,* **3576.**
**Ordovician** (*ôr-dō-vĭsh'ăn*) **period,** in geology, **1418,** *picture,* **1419.**
**Ordre pour le Merite, 979.**
**Oreads** (*ō'rē-ădz*), in Gk. myth., mountain nymphs, **2546.**
**Orebro** (*ē'rā-brō*), Sweden. Mfg. and trade town on Svarta R. near w. end of L. Hjelmar; pop. 35,000, diet of 1540 declared crown hereditary; diet of 1810 elected Bernadotte crown prince.
**Or'egon,** a n.w. state of U.S.; 96,699 sq. mi.; pop. 783,389; cap. Salem; **2593–8,** *maps,* **2596, 3584–5;** climate, **2594, 2973;** Columbia R., **845–6;** Crater L., **2400,** *picture,* **2401;** history, **2596–8, 2872, 3688, 1779;** irrigation, **1829;** origin of name, **3347;** pheasants introduced, **2759;** physical features, **2594;** Portland, **2885;** products, **2594–6, 2598, 161, 3333;** salmon fisherics, **3113;** state flower, **3347.**
**'Oregon',** U.S. battleship, **3306.**
**Oregon, University of,** at Eugene, Ore.; co-ed. state institution; opened 1876, chartered 1872; college of literature, science and arts, engineering, schools of music, commerce, graduate school; **2596,** *pieture,* **2595.**
**Oregon plan,** in legislation, **1779.**
**Oregon question,** dispute with Gt. Brit., **2597, 2872.**
**Oregon Trail,** emigrant route from Independence, Mo., to Fort Vancouver on the Columbia R., **3584–5,** *map,* **3605;** in Kan., **1909;** in Mo., **2273;** in Wyo., **3822.**
**Ore Mts.** Same as **Erzgebirge.**
**Orenburg** (*ō'rĕn-bŭrĸ*). Cap. of govt. of Orenburg in e. Russia, on Ural R.; pop. 147,000; frontier caravan center, large cattle trade.
**Ores,** natural substances containing metals, **2201;** assaying, **236;** typical reduction processes, **1480, 881–3.** *See also in Index* under names of metals.
**Orestes** (*ŏ-rĕs'tēz*), in Gk. myth., son of Agamemnon and Clytemnestra; killed his mother because she had killed his father; **1382.**
**Orford, Earl of.** *See in Index* **Walpole, Horace; Walpole, Sir Robert.**
**Organ,** a musical instrument, **2598–2600, 2383;** low and high notes, **3278;** in Puritan churches. **2379–80.**
**Organ'ic chemistry, 714, 642, 4043.** *See in Index* **Chemistry.**
**Organic evolution,** the evolution of living organisms, **1209.** *See in Index* **Evolution.**
**Organol'ogy,** of plants, **473.**
**Or'ganzine,** a silk thread, **3238.**
**Oriel** (*ō'rĭ-ĕl*) **College,** Oxford, founded. **2610;** *picture,* **2609.**
**O'rient,** meaning of word, **232.**
**Oriental lace, 1950.**
**Origen** (*ŏr'i-jĕn*) (185?–254?). Early Christian theologian, native of Alexandria, Egypt; his authority has waned as Augustine's has waxed; sought to reconcile Platonism and Christianity.
**'Origin of Species',** book by Darwin, **1208;** effect, **964, 398.**
**Oril'lia,** Ontario. Summer resort, r.r. and industrial town on L. Simcoe, 86 mi. n. of Toronto; pop. 9000; electro-smelting works, planing mills, clothing, furniture, and boat factories.
**Orinoco** (*ō-rē-nō'kō*) **River,** 3d largest r. of S. Amer., **2600, 3621,** *maps,* **3622, 3228–9;** discovered by Columbus, **3289;** llanos, **3620;** Raleigh's expeditions, **2600, 2976.**
**Oriole** (*ō'rĭ-ōl*), **2600–1,** *picture,* **417;** eats hairy caterpillars, **662;** hanging nest, **406,** *picture,* **407;** seasonal migration, **2231.**
**Orion** (*ō-rī'ŏn*), in Gk. myth., hunter loved by Artemis, **2601;** pursues Pleiades, **2838.**
**Orion,** a constellation, **2601;** location, *charts,* **873, 3343;** nebula, **2432;** vast size, **242.**
**Oriskany** (*ŏ-rĭs'kă-nĭ*), N. Y. Village 7 mi. n.w. of Utica; pop. 1101; bloody but indecisive Rev. battle between Americans under Gen. Herkimer and British and Indians Aug. 6, 1777; Herkimer mortally wounded.
**Oristano** (*ō-rēs-tä'nō*), Gulf of, **3127,** *map,* **1836.**
**Orizaba** (*ō-rē-zä'bä*), **Mt.,** highest peak in Mexico; 175 mi. s.e. of Mexico City; **2209, 1066.**
**Orkhan** (*ôr-kän'*) (1326–59), sultan of Turkey, **3559.**
**Ork'ney Islands,** Scotland, 375 sq. mi.; pop. 25,000; **2601,** *maps,* **1159, 1152.**
**Orlan'do,** lover of Rosalind in 'As You Like It', **224.**
**Orlando, Vittorio Emanuele** (born 1860), Ital. statesman; favored intervention in World War in advance of his party; prime minister 1917–19; owing to his failure to secure a settlement in Paris, his cabinet fell June 1919; at Peace Conference, **3808.**
**Or'leanists,** Fr. political party in 15th cent., supporters of the house of Orleans as opposed to that of Burgundy, **694;** also in 19th cent., a party rising out of the Rev. and led by house of Orleans; sought to establish constitutional monarchy; Louis Philippe, **1353.**
**Orleans** (*ôr-lā-äṅ'*), **dukes of.** Heads of a younger branch of Fr. royal house of Bourbon.
**Orleans, Louis Philippe, Duke of** (1747–93). "Philippe Egalité," the regent's greatgrandson; as "Citizen Equality" was elected Paris deputy to Convention 1792; voted for death of Louis XVI; executed under the Terror. His son was Louis Philippe, king of the French.
**Orleans, Philip, Duke of** (1674–1723). Regent of France during minority of Louis XIV; able but dissolute and corrupt; supported "Mississippi Bubble" scheme.
**Orleans,** France, historic city; pop. 75,000; **2601;** relieved by Joan of Arc, **1894, 1700,** *picture,* **1701.**
**Orlof,** a famous diamond,. **1004–5,** *pieture.* **1005.**
**Ormazd** (*ôr'măzd*), **Ormuzd,** or **Ahura Mazda,** in Zoroastrian religion. **3841.**
**Or'muz.** A small barren isl. at entrance to Persian Gulf; in Middle Ages headquarters of trade between Persia and India.
**Ormuz, Strait of, 2738.**
**Orne** (*ôrn*) **River,** in Normandy, France; flows n. 95 mi. to English Channel; **2513.**
**Ornithol'ogy,** a division of zoölogy, **3144.**
**O'rono,** Me., town on Penobscot R. 8 mi. n.e. of Bangor; pop. 3183; lumber mfrs.; U. of Maine; **2128.**
**Orphah** (*ôr'fä*), in Bible, sister-in-law of Ruth, **3101.**
**Orpheus** (*ôr'fē-ŭs*), in Gk. myth., musician of marvelous powers, **2601–2, 2376.**
**Or'pington,** a breed of fowls, **2911,** *pieture,* **2909.**
**Orris-root, 1814.**
**Orsini** (*ôr-sē'nē*). A noble Roman family, champions of the Guelfs against their hereditary enemies, the Colonna; first prominent in 12th cent.; two of its members became popes (Celestine III and Benedict XIII).
**Orsova** (*ôr'shō-vä*), Rumania. A fortified island-town on the Danube near the Iron Gates; pop. 5000.
**Orsted, Hans Christian.** *See in Index* **Oersted.**
**Or'thoclase,** a glassy, variously colored silicate of potassium and aluminum; relative hardness, **2248.**
**Orthodox Greek church.** *See in Index* **Greek Orthodox church.**
**Orthop'tera,** an order of straight-winged insects, **1788, 3946;** cockroaches, **818;** crickets, **921;** grasshoppers and locusts, **1503–6;** katydids, **1913–4;** mantises, **2137.**
**Ort'ler,** highest point in Tyrol and in e. Alps (12,800 ft.), **3573.**
**Or'tolan,** a bunting, **534.**
**Osage** (*ō-sāj'*) **melon, 2196.**
**Osage orange,** N. Amer. tree with inedible fruit, resembling a large orange; wood bright yellow, fine grained and very elastic; classified, **3533;** used in hedges, **1627;** related to breadfruit, **501.**
**Osage River,** a tributary of the Missouri in Kansas and Missouri; 500 mi. long; *map,* **2270.**
**Osages,** tribe of Plains Indians which originally ranged from Arkansas to Missouri rivers, **1767, 3584.**
**Osaka** (*ō'zä-kä*), 2d largest city and chief mfg. center of Japan on Osaka Bay; pop. 1,255,000; **2602;** textile mfrs., **1866.**
**Osawatomie** (*ŏs-ä-wät'ō-mĭ*), Kan., city 45 mi. s.w. of Kansas City; pop. 4772; attack of pro-slavery men 1856 resisted by John Brown and followers; latter finally overpowered and town practically destroyed; **516.**
**Osborn, Henry Fairfield** (born 1857). Amer. paleontologist, b. Fairfield, Conn.; connected with American Museum of Natural History since 1891; a fascinating writer ('Men of the Old Stone Age'; 'Origin and Evolution of Life').
**Osborne,** estate near E. Cowes, Isle of Wight, now seat of convalescent home for army and navy officers and of a Royal Naval College; home of Queen Victoria, **3640.**
**Osbourne, Lloyd** (born 1868), Amer. author, stepson of R. L. Stevenson, **3356.**
**Os'car I** (1799–1859). King of Sweden and Norway, son of Bernadotte (Charles XIV), succeeded to throne 1844.
**Oscar II** (1829–1907), king of Sweden and Norway, **3405.**
**Osceola** (*ŏs-ē-ō'lä*) (1804?–38). Seminole Indian chief, leader of 2d Seminole War, precipitated by seizure of his wife as fugitive slave; himself seized under flag of truce, died in captivity.
**Os'cillating currents,** electric, **1114;** produced by audion, **257.**
**Oscines** (*ŏs'ĭ-nēz*), scientific name for song-bird group, **419.**
**Osgood, Frances Sargent,** quoted, **3247.**

**O'Shea, Captain William Henry,** 2690.
**Osh'kosh,** Wis., city at junction of Fox R. and L. Winnebago, 75 mi. n.w. of Milwaukee; pop. 33,162; large sawmills, furniture factories; wholesale trade; **3772.**
**Osiers** (*ō'zhērz*), willow twigs used in basket-making, **3743.**
**Osiris** (*ō-sī'rĭs*), anc. Egypt. deity, **2602, 1099;** and Isis, **1832.**
**Oskaloo'sa,** Iowa. Agricultural and mining center 65 mi. s.e. of Des Moines; pop. 9427; Penn College.
**Os'ler, Sir William** (1849–1919). Canadian physician, b. Bondhead, Ontario; made international reputation as professor of medicine at Johns Hopkins Univ. 1889–1904; became regius professor of medicine at Oxford 1905; author of many medical works.
**Osman** (*ŏs'män*). Same as **Othman.**
**Osmanli** (*ŏs-măn'lĭ*), the Ottoman Turks, **3557–9.** *See also in Index* **Turkish Empire.**
**Os'mium,** a metallic element, **4042;** found with platinum, **2832.**
**Osmo'sis,** mixture of liquids through a separating membrane; of blood in capillaries, **1617;** in plants, **2825–6,** *picture,* **2823.**
**Osnabrück** (*ŏs-nä-brük'*). Industrial town of Hanover, Prussia, on Hase R. 30 mi. n.e. of Munster; pop. 85,000; iron and steel mfrs.; member of Hanseatic League.
**Os'prey,** or fish-hawk, **1606–7;** robbed by bald eagle, **1055.**
**Os'sa.** Mt. in anc. Thessaly (modern Kissovo). *See in Index* **Pelion.**
**Ossein** (*ŏs'ē-ĭn*), toughening material in bones, **452.**
**Ossian** (*ŏsh'an*) or **Oisin** (3d cent. A.D.), legendary Irish bard, son of Finn; supposed author of Macpherson's 'Poems of Ossian', **1166.**
**Ossining'** (formerly Sing Sing), N.Y. Residential village on Hudson R. 31 mi. n. of New York City; pop. 10,739; shoes, shirtwaists, perfumes; Sing Sing State Prison is just south.
**Os'soli, Margaret Fuller.** *See in Index* **Fuller, Margaret.**
**Ostade** (*ŏs-tä'dē*), **Adrian** (1610–85). Dutch painter, pupil of Hals; vigorous treatment of rustic life.
**Ostade, Isaac** (1621–49). Dutch painter, brother of Adrian; noted for winter landscapes.
**Ostend** (*ŏs-tĕnd'*), Belgium, seaport and resort on North Sea, 67 mi. n. w. of Brussels; pop. 46,000; repeatedly shelled in World War; harbor closed by British by sinking of ships May 10, 1918; **374, 3792, 3806.**
**Ostend Manifesto** (1854), **2802, 522.**
**Osteop'athy,** 2603, 2193.
**Ostia** (*ŏs'tĭ-ȧ*), port of Rome at mouth of Tiber, **3041, 3494.**
**Os'tiaks,** tribe of Finno-Ugric group inhabiting Ob valley in w. Siberia; language, **1702.**
**Ostracism** (*ŏs'trȧ-sĭzm*), in anc. Greece, banishment by popular vote; of Aristides, **194–5,** *picture,* **1519.**
**Os'trea,** the oyster genus of mollusks, **2612.**
**Os'trich,** a running bird, the largest of living birds, **2603;** altitude range, *picture,* **397;** egg, **408,** *picture,* **1091;** feathers, **1228;** foot, *pictures,* **409, 1323;** largest farm in U.S., **1859.**
**Os'trogoths** or **East Goths, 1491–2, 1195.**
**Ostrolenka** (*ŏs-trō-lĕng'kä*), Poland. Town 60 mi. n.e. of Warsaw; pop. 15,000; French defeated Russians 1807 and Russians suppressed Polish uprising 1831; changed hands frequently in World War.
**Ostwald** (*ŏst'vält*), **Wilhelm** (born 1853). Ger. chemist; leader in modern chemico-physics; Nobel prize winner in chemistry (1909).
**Oswe'go,** N.Y., port and re-shipment point for coal, grain, and lumber on L. Ontario at mouth of Oswego R.; pop. 23,626; machinery, matches, knit goods, office supplies; starch mfr., **3344.**
**Oswego River,** a short r. in N.Y. (24 mi.) entering L. Ontario at city of Oswego; part of N.Y. Barge Canal; power, **2485;** *map,* **2480.**
**Otaheite** (*ō-tȧ-hē'tē*). *See in Index* **Tahiti.**
**Otaru** (*ō'tä-rų*), Japan. Chief town on w. coast of Hokushu Isl. on s. shore of Ishikari Bay; pop. 103,000; marine experiment station; fisheries; large trade.
**'Otel'lo',** opera, **3628.**
**Otero** (*ō-tā'rō*), **Lake,** extinct lake in New Mexico, **2464.**
**'Othel'lo',** tragedy by Shakespeare, **2603–4, 3191;** quotations from, **2604, 3247.**
**Oth'man** or **Osman I** (1259?–1326), Turkish sultan, founder of Ottoman empire, **3557, 3559.**
**O'tis, Elisha Graves** (1811–61), Amer. inventor, b. Halifax, Vt.; elevator safety device, **1134.**
**Otis, James** (1725–83), Amer. Rev. orator, **2604, 470.**
**Otranto** (*ō-trän'tō*). Seaport on s.e. coast of Italy 46 mi. s.e. of Brindisi; during Middle Ages chief Adriatic port of Italy; sacked by Turks (1480).
**Otranto, Strait of.** Passage connecting Adriatic and Ionian seas and separating Italy from Albania; minimum width about 45 mi.
**O'Trigger, Sir Lucius.** In Sheridan's comedy 'The Rivals', fortune-hunting, duel-loving Irishman.
**Ottar** (9th cent. A.D.), Norwegian explorer, **2859.**
**Ottawa** (*ŏt'ȧ-wȧ*), Ill., farming trade center on Fox and Illinois rivers, 70 mi. s.w. of Chicago; pop. 10,816; glass, pottery, brick and tile, agricultural implements; glass, sand, and fire clay near by; Ft. St. Louis, **1964.**
**Ottawa,** Kan. City 50 mi. s.w. of Kansas City in farming section; pop. 9018; Ottawa Univ.
**Ottawa,** Ontario, cap. of Dominion of Canada; pop. 110,000; **2604–5,** *pictures,* **609, 621.**
**Ottawa, University of.** At Ottawa, Ontario; men; Cath.; founded 1849 (univ. since 1889); arts, science, theology, law, commerce.
**Ottawa Indians,** Algonquian tribe originally living about upper Ottawa R., Canada; driven to upper Michigan peninsula and later to lower peninsula, whence they spread into Ohio, Ind., and Ill.; **1766, 1772.**
**Ottawa River,** Canada, chief tributary of St. Lawrence; rises in Quebec, flows w., then s.e., forming boundary between Quebec and Ontario; length, 685 mi.; enters St. Lawrence by 2 channels enclosing isl. of Montreal; **2604, 2582;** Algonquian route, **1514;** canal system, **627;** lumbering, **2082.**
**Ottawa University.** At Ottawa, Kan.; co-ed., Bapt.; founded 1865; arts and science, pedagogy, business.
**Ot'ter,** a weasel-like, aquatic mammal, **2605;** fur, **1389, 1390.**
**Otterbein** (*ŏt'ĕr-bīn*), **Philip William** (1726–1813). Amer. clergyman, b. Germany; founded United Brethren in Christ.
**Otterbein University.** At Westerville, Ohio; co-ed.; founded 1847, and controlled by United Brethren.
**Ot'terburn.** Village in n.e. England, near Scotch border; Scotch under Douglas defeated English under Percys 1388; battle celebrated in ballad of Chevy Chase.
**Ottilien River,** in n. of New Guinea (150 mi.), **2453.**
**Ot'to** (1848–1916), king of Bavaria; insane throughout reign (1886–1912); his uncle, Prince Luitpold, regent; deposed; **1442.**
**Otto** (1815–67), king of Greece, very unpopular, forced to grant constitution and appoint ministry of Greeks (1843); **1526.**
**Otto I** (912–973), Holy Roman emperor, **2606, 1674;** extent of empire, **1447, 1842.**
**Otto II** (955–983), emperor, **2606.**
**Otto III** (980–1002), emperor, **2606;** at tomb of Charlemagne, **1.**
**Otto IV** (1174–1218), emperor, **2606.**
**Otto gas engine, 1404, 1405, 1406.**
**Ot'toman Empire.** *See in Index* **Turkish Empire.**
**Ottoman Turks,** branch of Turks which founded and rule Turkish Empire; named from Othman, first sultan (reigned 1288–1326); **3557–9.**
**Ot'tos,** or essential oils, in perfumes, **2728.**
**Ottum'wa,** Iowa. Market for agricultural and coal-mining dist., 75 mi. s.e. of Des Moines on Des Moines R.; pop. 23,003; abundant water-power; agricultural implements, iron products, packed meat.
**Ouachita** (*wąsh'ĭ-tą*) or **Washita Mts.,** outlying portion of main Ozark plateau, s. of Arkansas R. in Okla. and Ark.; height 1500 to 2500 ft.; **2576,** *maps,* **208, 2574;** whetstone rock, **207.**
**Ouachita** or **Washita River,** rises in w. Ark. and flows s.e. across n. La. to Red R. near latter's junction with Mississippi; **2070,** *maps,* **208, 2070.**
**Oudenarde** (*ų-dē-närd'dē*), Belgium, town on Scheldt R. 18 mi. s. of Ghent; victory of Allies under Marlborough and Prince Eugene of Savoy over French under Vendome (1708), **2150.**
**Oudh** (*oud*), province of Brit. India, in n. center; part of United Provinces of Agra and Oudh; 24,000 sq. mi.; chief city, Lucknow; **1745.**
**Ouida** (*wē'dȧ*). Pen name of Louise de la Ramée (1839–1908), Eng. novelist ('Under Two Flags', and children's stories, 'The Nürnberg Stove'; 'A Dog of Flanders').
**Ounce,** the snow leopard, *picture,* **1988.**
**Ounce,** a unit of measure, **3715.**
**'Our American Cousin'.** Play by Tom Taylor; first produced 1858; at a performance of this play Lincoln was assassinated.
**'Our Mutual Friend'.** Novel by Charles Dickens (1865); plot centers around Lizzie Hexam, the bargeman's daughter, and Eugene Wrayburn, her lover.
**Ourthe** (*ųrt*), r. of Belgium, flows n. 100 mi. to Meuse, **2207, 1995.**
**Ouse** (*ųz*), **Great.** River in e. of England flowing into Wash near King's Lynn; length 160 mi.
**Outer Mongolia,** n. w. part of Mongolia, a high plateau, **2285.**
**Outlanders** or **Uitlanders,** in S. Africa, **3281.**
**Outram** (*ų'trȧm*), **Sir James** (1803–63), Eng. general, "Bayard of India"; at Lucknow, **2075.**
**Oval window,** membrane of inner ear, **1057.**
**O'vary,** in plants, the receptacle in which fertilized seed-germs develop; in flowers, **1304, 1306, 1310, 1311.**
**Oven,** bakery, **499,** *picture,* **498;** coke, **824.**
**Ovenbird, 3669.**
**Overhand knot, 1938.**
**Overshot waterwheel, 3695.**
**Overtone,** in music, **3278.**
**Ov'id** (Publius Ovidius Naso) (43 B.C.–18 A.D.), Rom. poet, **1967.**
**Oviedo** (*ō-vē-ā'thō*). Industrial city of n. Spain, 16 mi. s. of Bay of Biscay; pop. 55,000; univ.; twice plundered by French in Peninsular War (1809 and 1810).

**Ovip'arous animals,** 1090; insects, 1786.
**Ovipos'itor,** egg-laying structure of insects, 1787; of grasshopper, *picture,* 1504; of ichneumon fly, 1724.
**O'vis,** the sheep genus of animals, 3200, 392.
**Ovule** (*ō'vūl*), an unfertilized seed, 1304; fertilization of, 1310, 1311.
**O'vum.** Same as **Egg.**
**Owen, Robert** (1771–1858), Eng. Utopian socialist, 3268, 879.
**Owensboro,** Ky. Center of agricultural and mineral region and important tobacco market, 80 mi. s. w. of Louisville; pop. 17,424; tobacco products, wagons, machinery.
**Owen Sound,** Ontario. Port at mouth of Sydenham R., on Owen Sound, inlet of Georgian Bay; pop. 12,612; grain and lumber trade; iron, steel, and lumber products, cement.
**Owens River,** in s.e. California, flows s.e. and s. 175 mi. to Owens L., 3736.
**Owl,** a nocturnal bird of prey, 2606–7, *pictures,* 403, 411, 415, 2411; eye, 1213; eats field mice, 402; feather, *picture,* 1228; foot, *picture,* 409; incubation of eggs, 408.
**Owlet-moth family,** or *Noctuidae,* 3947.
**Owos'so,** Mich. Industrial city 75 mi. n.w. of Detroit on Shiawassee R.; pop. 12,575; large beet-sugar industry; iron products, furniture, caskets.
**Ox'alis,** a genus of plants including the wood sorrel, 2607.
**Oxcart,** *pictures,* 3524, 3525, 2890.
**Ox'en** (plural of ox). *See in Index* **Cattle.**
**Ox-eye daisy,** or "Black-eyed Susan," 953.
**Ox family,** or *Bovinae.* A sub-family of bovine animals with short cannon bones, as cattle and buffaloes.
**Ox'ford,** England, famous university town, 52 mi. n.w. of London; pop. 60,000; 2608–11.
**Oxford,** Miss. Cotton-growing center 60 mi. s.e. of Memphis, Tenn.; pop. 2150; state univ.
**Oxford,** Ohio. Town in farming region 30 mi. n.w. of Cincinnati; pop. 2146; Miami Univ., Oxford College, Western College.
**Oxford Down,** a breed of sheep, 3200.
**Oxford movement,** in church of England, 2462.
**Oxford Reformers,** in Eng. Renaissance, 2325.
**Ox'fordshire.** County of s.-cent. England; 756 sq. mi.; pop. 190,000; agriculture, stock-raising, manufacturing; county town, Oxford.
**Oxford University,** 2608–11; religious restrictions removed, 1468; Rhodes scholarships, 3011–2.
**Ox Hill, battle of.** *See in Index* **Chantilly,** Va.
**Oxida'tion,** chemical union with oxygen; causes fire, 1249; rust, 3098–9.
**Oxides** (*ŏks'īdz*), compounds with oxygen; arsenic, 220; calcium (lime), 2010; carbon, 642; copper, 883; iron, 1817, 1816, 3098–9; lead, 1973; nitrogen, 2511, 125, 1383; reduced by heated aluminum, 105; silicon, 3233; sulphur, 3389, 3390; tin, 3504; zinc, 3839.
**Ox'us,** anc. name of Amu R., 228.
**Oxyacet'ylene torch,** used in cutting and welding metal, 7.
**Oxygen** (*ŏks'ĭ-jĕn*), a gaseous element, 2611–2, 4039, 4042; affinity for aluminum, 105; in air, 50, *pictures,* 51, 52; amount in earth, 711, *picture,* 1058; in blood, 437–8, 1616–7; in breathing, 2083, 2998, 438; combined with hydrogen, 1710; in explosives, 1212; in combustion, 1249, 1619; liquefied, 2025; in plant breathing, 2824–5, 1980; in protoplasm, 394; rusts iron, 3098–9. *See also in Index* **Oxides.**
**Oxy-hydrogen flame,** 1710, 2010, 3716.
**Oxy-welding,** 3716.
**Oyama** (*ō-yä'mä*), **Iwao, Prince** (1842–1916), Japanese field-marshal; captured Port Arthur in war with China; commander-in-chief in war with Russia; at Mukden, 3098.
**Oyster Bay,** N.Y., residential town and summer resort on Long Island, 30 mi. n.e. of New York City; pop. 20,296; home of Roosevelt; 2061.
**Oyster drill,** a boring snail, 3256.
**Oyster plant.** Same as **Salsify.**
**Oys'ters,** 2612–6; eggs, 2612, 1090; evolutionary position, 128; pearls, 2703; preyed upon by starfish, 2614, 3344, *picture,* 3345. —*U.S. fisheries,* 1283, 2612, 2615; La., 2070; Md., 2160, S.C., 3292; Va., 3648, 3650.
**Oyster-shell scale,** 3133.
**Ozaka,** Japan. Same as **Osaka.**
**Ozark** (*ō'zärk*) **Mts.,** a low plateau in the Mississippi valley between the Missouri and Arkansas rivers, 2616, 3581, 3590; in Ark., 207; Mo., 2269, 2270, 2272; Okla., 2576.
**Ozokerite** (*ō-zō-kē'rīt*), or mineral wax, 2750.
**Ozone** (*ō'zōn*), a form of oxygen, 2612.

# P

ONE of the Egyptian hieroglyphs was a shutter  This developed into the character  which was borrowed by the Phoenicians. They called it *Pe*, "mouth," perhaps because they thought it looked like a mouth with teeth.  When they themselves wrote it, they simplified it so that it is hard to see the resemblance to a mouth  but they still kept the name. The Greeks used the same form but turned the hook to the right. They afterwards squared the top thus  and finally made the two legs of equal length, in the character  which became the modern Greek letter *Pi*. The Romans adopted the rounded form  which they curved more and more until finally the semicircle was closed exactly as in our letter P. The name, you will note, has changed very little, and the same is true of the sound, which is formed by closing the lips for an instant, then allowing the breath to escape through them explosively.

**Pachmann** (*päĸ'män*), **Vladimir de** (born 1848). Rus. pianist, especially noted for brilliant interpretations of Chopin's works and for his platform eccentricities; retired 1913.

**Pachomius** (*pȧ-kō'mĭ-ŭs*), **Saint** (292?–346?), Egypt. monk; establishes first monastery, **2298.**

**Pachuca** (*pä-chy'kä*), Mexico. City 55 mi. n.e. of Mexico City; altitude 8000 ft.; pop. 39,009; cap. state of Hidalgo; silver mines, reduction plants.

**Pacific** (*pȧ-sĭf'ĭk*) **Highway, 3024.**

**Pacific Islands, 2617–25,** *map,* **2624–5;** breadfruit, **501;** canoes, *pictures,* **443;** coconut palm, **818–20;** superstitions of natives, **2117, 2118.** *See also* under names of chief islands and groups.

**Pacific Ocean,** largest of the oceans, **2617–25,** *map,* **2624–5;** area, **2553, 2554;** Bering Sea, **384;** cables, **561;** explorations, **2617, 2623, 874, 1030–1, 2115–6;** greatest depth, *diagram,* **2554;** Japanese current, **2558, 77, 581;** relief of floor, *picture,* **561;** salmon fisheries, **3113–4, 1285;** theory of formation, **1060;** waterspouts, **3701.**

**Pacific time, 3500.**

**Pacific University.** At Forest Grove, Ore.; non-sectarian, co-ed.; founded 1849; liberal arts, music.

**Packard, Frank Lucius** (born 1877), Canadian novelist, **624.**

**Packing industry.** *See in Index* **Meat packing.**

**Pack** or **wood rat, 2977.**

**Pacto'lus,** anc. r. in Lydia, the present Sarabah, rises in Mt. Tmolus; flows n.w. to Hermus River; gold, **923.**

**Padang** (*pä-däng'*), Sumatra, town in center of w. coast; pop. 40,000; **3391.**

**Pad'dington.** Metropolitan borough of w. London, England; pop. 144,000; formerly noted for picturesque rural scenery.

**Paddlefish.** A fish of the Mississippi R. system, remarkable for its long spadelike snout with which it stirs up mud to get its food; sometimes reaches a length of 6 ft. or more; also called "spoon-billed catfish."

**Paddle wheel steamers, 3212, 3218,** *picture,* **3208.**

**Paddy, 3227.**

**Paderewski** (*pä-dĕ-rĕv'skē*), **Ignace Jan** (born 1860), Polish musician and statesman, **2625, 2856, 2859.**

**Padre** (*pä'drā*) **Island,** long reef off coast of Texas, **3474.**

**Padua** (*păd'ū-ȧ*) (Ital. *Padova*), Italy, educational and art center and trade and mfg. city on Bacchiglione R., 22 mi. w. of Venice; pop. 105,000; univ. (13th cent.) one of oldest in Europe; Basilica of St. Anthony, *picture,* **1846;** fresco by Giotto, *picture,* **2631;** medical school, **121.**

**Paducah** (*pȧ-dū'kȧ*), Ky. City in n.w. corner on Ohio and Tennessee rivers; pop. 24,735; large trade in leaf tobacco; farming, timber, and mineral region; lumber, tobacco, textile mfrs.

**Paestum** (*pĕs'tŭm*) (originally Posidonia). Gk. city on w. coast of Italy on Gulf of Salerno; founded 6th cent. B.C.; conquered by Romans 273 B.C.; destroyed by Saracens in 9th cent.; ruins of 3 Doric temples among most remarkable of antiquity.

**Paganini** (*pä-gä-nē'nē*), **Nicolo** (1784–1840). Ital. violinist, called "most extraordinary executant ever known"; great power and control of tone, intense passion of style.

**Page, Charles G., 3458.**

**Page, Thomas Nelson** (1853–1922). Amer. novelist, b. Hanover County, Va., ambassador to Italy 1913–19; author 'Meh Lady', 'Marse Chan', 'Two Little Confederates', and other stories, often in negro dialect, of Virginia life.

**Page, Walter Hines** (1855–1919). Amer. editor and diplomat, b. Cary, N.C.; editor *Atlantic Monthly* 1896–99, *World's Work* 1900–13; ambassador to Gt. Brit. 1913–18.

**Page,** how trained for knighthood in Middle Ages, **1933.**

**Pageant** (*păj'ȧnt*), **2625–6, 2259,** *pictures,* **1033, 1035.**

**'Pagliacci'** (*pä-lē-ä'chē*), opera, **2584.**

**Pago'da,** an oriental sacred tower-like structure, *pictures,* **541, 1753, 2708.**

**Pagopago** (*pä'gō-pä'gō*), U.S. seat of govt. in Samoa, **3120.**

**Pahang** (*pä-häng'*), largest of Federated Malay States; 14,000 sq. mi.; pop. 120,000; agriculture; tin and gold; **2130.**

**Pain, 3520;** anesthetics, **124–5.**

**Paine, Robert Treat** (1731–1814). Amer. lawyer and statesman; signer of Declaration of Independence.

**Paine, Thomas** (1737–1809), Amer. author and patriot, **2626, 975, 112.**

**Painted Desert,** in Ariz., **200.**

**Painting,** history of, **2627–41;** American, **2634;** ancient, **2627–8, 1100, 1529, 1533,** *pictures,* **1102, 1526;** cave men, **668,** *pictures,* **666, 668, 2628;** Chinese, **744;** composition, **1243–6;** Dutch and Flemish, **2630–1;** early Christian, **2108, 2628;** English, **2631, 2632;** famous pictures, **2635–41;** impressionism and post-impressionism, **2633–4;** Japanese technique, **1873–4, 1954;** perspective, **2740;** Pre-Raphaelites, **2329, 2632;** processes, **2629;** Renaissance, **2628–30, 2996–7.**

**Paints and varnishes, 2642–3;** "aluminum," **105, 104;** gums, **1552;** gypsum base, **1555;** lacquer, **1954;** lead in, **1973;** resins, **2997;** turpentine, **3561–2;** varnish, **3619.**

**Paisley** (*pāz'lĭ*), Scotland, mfg. center on White Cart Water 7 mi. s.w. of Glasgow; pop. 90,000; noted Paisley shawls no longer made; cotton thread and textiles; **3147, 3493.**

**Paita** (*pī'tä*), Peru, a seaport with excellent harbor; pop. about 5000; cotton, tobacco, panama hats; oil, **2744.**

**Palamedes** (*păl-ȧ-mē'dēz*), in Gk. myth., Trojan War hero, **2562.**

**Pal'amon and Arcite** (*ăr'sīt*), Chaucer's story of retold, **704, 706.**

**Palanquin** (*păl-ȧn-kēn'*), covered litter for carrying passengers; in India, *picture,* **1747;** Japanese, *picture,* **1867.**

**Palate.** The roof of the mouth; it consists of the hard palate in front and the soft palate behind; the former has a bony framework, while the latter is composed of muscular fibers inclosed by a movable fold of mucous membrane.

**Palat'inate, The,** or **Rhenish Palatinate** (Ger. *Rheinpfalz*), province of Bavaria, Germany, lying w. of Rhine; Heidelberg former cap., **1628;** wasted by Louis XIV, **2066.**

**Palatine** (*păl'ȧ-tīn*) **Hill,** central and earliest settled of the 7 hills of Rome; its rectangular shape gave name *Roma quadrata* to primitive city founded, according to legend, by Romulus; **3040, 3056.**

**Palawan** (*pä-lä'wän*), westernmost of the larger isls. of the Philippines; 4027 sq. mi.; **2764,** *map,* **2624–5.**

**Palazzo Vecchio** (*pä-lät'sō vĕk'kē-ō*) (Old Palace), Florence, **1849.**

**Pale,** in heraldry, **1639.**

**Palembang** (*pä-lĕm-bäng'*), port of Sumatra, Dutch E. Indies; pop. 60,000; on Musi R. 45 mi. from its mouth; export trade; makes silk, gold articles, weapons; **3391.**

**Paleobot'any, 473.**

**Pale of Settlement, 1892.**

**Paleolith'ic Age,** the Old Stone Age, **3360;** cave dwellers, **666–8.**

**Paleontol'ogy,** the science of fossils, **1336;** evidence for evolution, **1209, 398.**

**Paleozo'ic era,** in geology, **1418–20.**

**Palermo** (*pä-lĕr'mō*), seaport and largest city of Sicily on n.w. coast; pop. 346,000; military post; exports fruit, sulphur; univ.; **3230.**

**Palestine** (*păl'ĕs-tīn*), s. part of Syria, 15,000 sq mi.; pop. 650,000;

**2643–7, 3425–6,** *map,* **232–3;** agriculture, **48, 2643, 2645,** *pieture,* **46;** Hebrew language, **1624–5;** historic places, **2643–5;** Jerusalem, **1885–6;** named from Philistines, **2770;** medieval pilgrimages, **2807.** —*History,* **1889–91, 1655–7;** wars between Philistines and Israelites, **2770;** David, **967;** Solomon, **3274;** Assyrian conquest, **297;** under Ptolemies, **1107;** the Herods, **1645;** Crusades, **929–32;** in World War, **2643, 2645, 3798, 3807;** British mandatary, **2648;** Zionism, **1892, 2646–7.**

**Palestine,** Tex. Industrial city about 100 mi. s.e. of Dallas; pop. 11,039; cotton and iron products, packed beef; trade in cotton, grain.

**Palestrina** (*pä-lēs-trē'nä*), **Giovanni Pierluigi da** (1524?–94), Ital. composer and master of sacred music, reformer of Rom. church music, **2378,** *picture,* **2377.**

**Paley** (*pā'lĭ*), **William** (1743–1805). Eng. clergyman and philosopher, chiefly remembered for his "argument from design" to prove the existence of God ('Evidences of Christianity'; 'Natural Theology').

**Palgrave** (*pȧl'grāv*), **Francis Turner** (1824–97). Eng. critic and poet (anthology, 'Golden Treasury of English Songs and Lyrics').

**Pali** (*pä'lē*) (Sanskrit "sacred text"), an anc. language of n. India, surviving in Burma, Ceylon, and Siam; language of Buddhism, **525.**

**Palimpsests** (*păl'ĭmp-sĕsts*) (Gk. "scraped again"), manuscripts, **390.**

**Palisades** (*păl-ĭ-sādz'*), **The,** on the Hudson R., **1692,** *pieture,* **2481;** geologic structure, **2480.**

**Palissy** (*pä-lē-sē'*), **Bernard** (1510?–89), Fr. artist, potter, naturalist, and writer; one of first men in Europe to formulate correct theory of fossils ('Autobiography', "one of most interesting ever written"); discovers new enameling process, **2906,** *picture,* **2905.**

**Pal'la,** Rom. garment, **897,** *pieture,* **898.**

**Palladino** (*päl-ȧ-dē'nō*), **Eusapia** (1854–1918). Ital. spiritualistic medium, celebrated through investigations of Lombroso, Lodge, Myers, and Münsterberg.

**Palladio** (*päl-lä'dē-ō*), **Andrea** (1518–80). Ital. architect, "standard-bearer of late Renaissance," for whom the classical Ital. style called "Palladian" is named.

**Palla'dium,** a rare metallic element, **4042;** found with platinum, **2832.**

**Pallas** (*păl'ȧs*), in Gk. myth., a name of Athena, **249.**

**Pallas,** an asteroid, **237.**

**Pall Mall** (*pĕl mĕl*), London street famous for clubs and palaces; origin of name, **926.**

**Pall-mall,** a game, **926.**

**Palm** (*päm*), a tropical tree, **2647;** coconut, **818–20;** date, **966–7,** *pieture,* **966;** oil, **1227;** royal, **936;** sago, **3104;** structure of trunk, **3532;** vegetable ivory, **1854,** *pieture,* **549.**

**Palma** (*päl'mä*), **Jacopo** or **Giacomo** (1480?–1528). Ital. painter of Venetian school; called Palma Vecchio ("The Elder"); strongly influenced first by Bellini, later by Giorgione; work characterized by rich coloring and brilliant lighting.

**Palma, Jacopo** (1544?–1628). Venetian painter, called "the Younger" to distinguish him from his great-uncle; a master of expression, but somewhat mechanical in method.

**Palma, Tomas Estrada** (1835–1908). Cuban patriot and general, first president (1902–06) of Cuban Republic.

**Palma,** Spain. Port and cap. of Majorca, largest of Balearic Isles, at head of Bay of Palma; pop. 68,000; lively trade; numerous mfrs.; Gothic cathedral with tomb of James II (d. 1311).

**Palmaceae** (*păl-mā'sē-ē*), the palm family of plants, **2647, 3939.**

**Palma dum,** nuts, **549–50.**

**Palmas** (*päl'mȧs*), **Cape,** on w. coast of Africa, **256.**

**Palmate** (*păl'māt*) **leaves, 1981.**

**Palm Beach,** Fla., fashionable winter resort on s.e. coast, on a peninsula; cut off from mainland by L. Worth, an arm of Atlantic; residential pop. 1135; **1300.**

**Palm cabbage,** terminal bud of various palms, **818.**

**Palmer** (*päm'ẽr*), **Alice Freeman** (1855–1902). Amer. educator, b. Colesville, N.Y.; pres. of Wellesley College 1882–87, non-resident dean of women, U. of Chicago, after 1892.

**Palmer, A. Mitchell** (born 1872). Amer. alien property custodian during World War; atty.-gen. in President Wilson's cabinet 1919–21; b. Moosehead, Pa.

**Palmer, John McAuley** (1817–1900). Amer. soldier and politician, b. Eagle Creek, Ky.; maj.-gen. commanding division at Murfreesboro and Chickamauga; corps commander in Atlanta campaign; gov. of Illinois 1869–73; U.S. senator 1891–97; Gold Democratic candidate for president 1896.

**Palmers,** pilgrims returning from Palestine, **2807.**

**Palmerston** (*päm'ẽr-stȯn*), **Henry John Temple, Viscount** (1784–1865), Eng. statesman, foreign minister 1830–41, 1846–51; home secretary 1852–55; prime minister (Whig) 1855–58, 1859–65; though of an ardent, contentious, sometimes erratic, temperament, he had lofty conception of his and England's duties; friend of the down-trodden and oppressed; **3639, 781.**

**Palmetto** (*păl-mĕt'ō*), a type of fan palm, **2647;** botanical classification, **3534;** in Fla., **1295.**

**Palmetto State, 3290, 2647.**

**Palmitic** (*păl-mĭt'ĭk*) **acid, 1227.**

**Pal'mitin, 1227.**

**Palmito,** Tex., scene of last battle of Civil War; in extreme s. point of state, on lower Grande R., near Palo Alto; **780.**

**Palm oil, 2647, 1227.**

**Palm Sunday, 1070.**

**Palmyra** (*păl-mī'rȧ*), Syria, anc. city in an oasis; cap. of former kingdom; **2648.**

**Palo Alto** (*pä'lō ăl'tō*), Calif., city 30 mi. s.e. of San Francisco; pop. 5900; Leland Stanford Junior Univ., **580,** *picture,* **581.**

**Palo Alto,** plain in s. Tex. 8 mi. n.e. of Brownsville; battle in Mexican War (May 8, 1846), **2207.**

**Palos** (*pä'lōs*), Spain, town on w. coast 55 mi. s.w. of Seville; pop. about 1600; Columbus sails from, **848.**

**Paludic'olae,** the marsh-bird order, **412;** includes cranes, **3365;** rails and coots, **2961.**

**'Pam'ela, or Virtue Rewarded',** novel by Richardson; story of a simple country girl whose master, failing to seduce her, marries her; **2540, 1166.**

**Pamir** (*pä-mēr'*), plateau in cent. Asia at convergence of Hindu Kush, Himalaya, Kuenlun, and Tian Shan Mts.; little vegetation; sheep pastures; Kirghiz tribes; **226, 3556.**

**Pamlico** (*păm'lĭ-kō*) **Sound,** N.C., largest of the lagoons on Atlantic coast of U.S., **2518;** canvasback ducks, **1045.**

**Pam'pas,** Argentine plains, **2790, 190, 191.**

**Pampas deer, 981.**

**Pamphylia** (*păm-fĭl'ĭ-ȧ*). Ancient mountainous region on s. coast of Asia Minor; successively under rule of Lydia, Persia, Macedon, Syria, and Rome; chief cities were originally Gk. colonies.

**Pan,** in Gk. myth., god of flocks and pastures, **2648;** musical contest with Apollo, **2230;** and Syrinx, **2376.**

**Panama** (*păn-ȧ-mȧ'*), cap. and chief Pacific port of Republic of Panama, on Gulf of Panama at s. terminus of Panama Ry.; pop. 60,000; **2649, 2651;** death rate, **2654.**

**Panama, Isthmus of,** strip of land connecting N. and S. Amer.; runs e. to w. in form of an S; usually regarded as co-extensive with Republic of Panama; average width 70 mi.; **2649, 2651.**

**Panama, Republic of,** the southernmost of the Cent. Amer. states; 32,380 sq. mi.; pop. 400,000; **2648–9,** *maps,* **680, 2514–5, 2662;** canal, **2651–63;** climate, **2652;** history, **2649, 2653, 2663, 3062;** physical features, **2649, 2652;** railroads, **2651, 123;** tagua nuts, **549.**

**Panama-California Exposition,** at San Diego, Calif., Jan. 1, 1915, to March 31, 1917; longest exposition in history; **3124.**

**Panama Canal, 2650–63, 3586;** advantage of route over Nicaragua, **1066;** channel buoys, **8;** construction, **2653–8, 1477;** cost, **2662, 1149;** proposed by Champlain, **687;** sanitation, **2651–5, 1490;** strategic importance, **2663, 3306;** Tolls Act repealed, **3746;** type of dredge used, **1040.**

**Panama Canal Office, 3599.**

**Panama Congress** (1826), **15.**

**Panama hats, 1597, 1078, 1079.**

**Panama-Pacific International Exposition,** world's fair held at San Francisco, Calif., Feb. 20 to Dec. 4, 1915, to celebrate opening of Panama Canal; 36 foreign nations participated; area of grounds 635 acres; cost $50,000,000; **3124;** $50 gold pieces, **2259.**

**Panama Tolls Law, 3746.**

**Pan-American Conference** or **Congress,** name given to meetings of delegates from countries of N., S., and Cent. Amer. to consider various questions of mutual interest; first meeting called, **435.**

**Pan-American Exposition,** held at Buffalo, N.Y., May 1 to Nov. 2, 1901, to illustrate progress of civilization in W. Hemisphere in 19th cent.; area of grounds 350 acres; attendance 8,179,674; cost $8,860,757; gate receipts $5,534,643; President McKinley assassinated while holding a reception in Temple of Music; **527.**

**Pan-American Union,** official organization of the republics of N. and S. Amer. maintained at Washington since 1890 for development of commerce and preservation of friendship and peace, **3289;** sculptures in front of building, *pictures,* **109.**

**Panathena'ic Festival,** oldest and most important of anc. Athenian festivals, in honor of goddess Athena, **249;** Parthenon frieze, **11–12,** *pictures,* **248, 1532.**

**Panay** (*pä-nī'*). An isl. nearly in center of Philippine group, 5th in size (4448 sq. mi.); Iloilo chief city, 250 mi. from Manila; fine grazing land, but sugar, rice, and copra are chief crops; deer abound.

**Pancreas** (*păn'krē-ȧs*), a gland in the abdomen, **1469, 1470;** function in digestion, **1011.**

**Panda'nus tree,** tropical tree or shrub, also called screw-pine because of spiral arrangement of leaves, **2621.**

**Pan'dects,** of Justinian, **1905.**

**Pando'ra,** in Gk. myth., the first woman, **2663–4.**

**Pan-Germanism,** a movement which conceives Ger. people wherever located as forming one nationality; some Pan-Germans deny any political ambition and claim only a desire to spread Ger. culture; others proclaim ultimate dominion of Ger. race; **1449.**

**"Panhandle,"** of Texas, **3474, 3476;** part ceded to Oklahoma, **2576.**
**Panhandle State, 3347.**
**Pan'icle,** a compound flower-cluster, **1305.**
**Pan'ics, financial,** in U.S.; of 1837, **3616, 1857;** of 1869 ("Black Friday") **3606;** of 1873, **3606, 1499;** of 1893, **790–1.**
**Panicum** (*păn'ĭ-kŭm*), a genus of grasses including millets, **2239.**
**Pank'hurst, Christabel** (born 1880), Eng. suffragettc, **3779.**
**Pankhurst, Emmeline** (born 1854), Eng. militant suffrage leader; founded in 1903 Women's Social and Political Union, and, with her daughters, Christabel and Sylvia, led campaign of "suffragette" violence; **3779.**
**Pankhurst, Sylvia** (born 1882), Eng. suffragette, **3779.**
**Pannonia** (*pă-nō'nĭ-ȧ*). Province of Roman Empire, lying s. and w. of Danube R.; Illyrians were probably original inhabitants.
**Pan's house of,** *picture,* **2877.**
**Pan-Slavism.** Movement toward political and cultural union of nations of Slavic descent; influenced Austro-Hungarian politics, n. and s. Slavs, tending toward united action against Magyars and Germans; congresses held 1848 at Prague, 1867 at Moscow, and 1908 at Prague; formation of Czecho-Slovakia and Jugo-Slavia is a partial realization of Pan-Slavism.
**Pan's pipes, 2376, 3781.**
**Pansy,** a cultivated type of violet, **2664;** explosive seed-pods, **3171.**
**Pantag'ruel,** giant in Rabelais' satire 'Gargantua and Pantagruel', **2951.**
**Pantelleria** (*păn-tĕl-lā-rē'ȧ*) or **Pantalaria.** Volcanic isl. in Mediterranean 62 mi. s.w. of Sicily; belongs to province of Trapani, Sicily; 45 sq. mi.; exports wine, raisins; chief town, Pantelleria (pop. 9000).
**Pan'theism,** belief that the universe as a whole is God; in Brahmanism, **1651.**
**Pan'theon,** Rome, **1201, 3058, 177;** model, *picture,* **181.**
**Panthéon** (*pŏn-tā-ôn'*), Paris, formerly church of Ste. Geneviève, begun 1764; secularized at Revolution and dedicated to great men of nation; later again used as church but finally secularized by decree of 1885; **2684, 1695.**
**Pan'ther,** name applied to leopard, **1989;** to puma, **2933.**
**'Panther',** Ger. warship, **2327.**
**Pan'tomime,** a play in which the story is told by gestures without dialogue, **1033, 1039.**
**Panuco** (*pä'nọ-kō*), dist. of e.-cent. Mexico about Panuco R.; oil field, **2212.**
**Papacy** (*pā'pȧ-sĭ*), **2664–6;** origin, **2664, 2745;** early growth of papal power, **763, 1195;** acquires Ravenna, **2979;** and Charlemagne, **688–90;** investiture conflict, **1541, 1632–3, 1447, 3740;** Crusades, **929–32;** conflict with Frederick I, **1358;** submission of John of England, **1896;** Otto IV excommunicated, **2606;** struggle with Frederick II and overthrow of Hohenstaufens, **1358, 2391;** conflict with Henry II of England, **358;** supports Guelfs, **1293, 1546;** dominated by France during "Babylonian Captivity," **2762–3, 454, 1541;** Great Schism, **3607, 1705;** Inquisition, **1780;** Luther attacks, **2084, 2085;** Reformation, **2987–9;** relations with Henry VIII, **1636;** Counter-Reformation, **2989, 764, 2075;** and Italian unity, **1837, 1838;** loses temporal power, **2813, 2666.** —*Church Councils,* **763–4;** Constance, **1705;** Nicaea, **870, 1070;** Trent, **2989.** For list of popes *see in Index* **Pope.**
**"Papa Haydn,"** **1609.**
**Papal States, 2666;** origins, **2979, 1836–7, 1195;** enlarged by Julius II, **1902, 450;** join United Italy, **1838.** *See also in Index* **Papacy.**
**Papa'ver,** the poppy genus, **2880.**
**Papaw** (*pą-pą'*), tropical tree with orange-colored fruit, **1378;** classified, **3533;** also a N. Amer. tree with pulpy fruit, **1378.**
**Papeete** (*pä-pā-ē'tē*). Cap. of Tahiti and other Fr. isls. of e. Pacific; pop. 3600, half of them French.
**Paper, 2666–73;** anc. and medieval writing materials, **2666–7, 455;** bleaching, **435;** gypsum filler, **1555;** materials used, **2667, 673, 906, 1906, 2674, 3333;** microscopic structure, *picture,* **2229;** for paper money, **2284;** sizes of, **2673;** wall paper, **3665–7.**
**Paper birch, 399.**
**Paper money, 2282, 2284, 328;** causes U.S. panic of 1837, **1857;** inflates Civil War prices, **781;** made legal tender, **3605–6;** Grant vetoes bill for issuing, **1499;** Greenback Party, **2871.**
**Paper mulberry,** a bushy mulberry used in papermaking, **2667;** in Japan, **1866;** on Pacific isls., **2622.**
**Paper nautilus.** Same as **Argonaut.**
**Paphlagonia** (*păf-lȧ-gō'nĭ-ȧ*). Anc. country of Asia Minor on Black Sea; subdued by Croesus; later became part of Rom. provinces of Galatea and Bithynia; made separate province by Constantine.
**Paphos** (*pā'fŏs*). Name of 2 anc. cities on w. coast of isl. of Cyprus; Old Paphos, founded about 10th cent. B.C., was chief seat of worship of Aphrodite; New Paphos was cap. of isl. in Rom. times.
**Papier-mâché** (*pä-pyā' mä-shā'*), paper product resembling wood, **2673;** buttons, **550;** in lacquer-ware, **1954;** molds for stereotype plates, **2472;** in taxidermy, **3442.**
**Papil'io,** a butterfly, *picture* facing **548.**
**Papil'lae,** of skin, **3246, 1571;** taste buds, **3513, 3440.**
**Papin** (*pă-păn'*), **Denis** (1647–1712?), Fr. physicist; greatly improved air pump, conceived idea of pneumatic transmission of power, invented the digester; constructs piston engine, **3348.**
**Papineau** (*pä-pē-nō'*), **Louis Joseph** (1786–1871), leader of Fr.-Canadian rebellion of 1837, **2673;** results of rebellion, **2947.**
**Paprika** (*pä'prē-kä*), a red pepper, **2723–4, 1702.**
**Papua** (*pä'pụ-ȧ*), **Territory of,** s.e. New Guinea and neighboring isls.; 90,540 sq. mi.; pop. 250,000; administered by Australia; formerly called Brit. New Guinea; **2453.** Name also applied to New Guinea as a whole.
**Papuan race, 2451, 1072.**
**Papyrus** (*pȧ-pī'rŭs*), a plant and the paper made from it, **2674, 2666–7, 455;** Bible manuscript, *picture,* **388.**
**Pará** (*pä-rä'*) (official name Belem), Brazil, seaport in n. on Para R. 55 mi. from Atlantic; pop. 275,000; r.r. connections with Bragança; rubber, **3073, 3074, 495–6,** *picture,* **3072.**
**Pará.** R. in Brazil; estuary of the Tocantins and also one of mouths of the Amazon.
**Paracelsus** (*păr-ȧ-sĕl'sŭs*). Assumed name of Theophrastus Bombastus von Hohenheim (1493–1541), German-Swiss physician and chemist; scientific theories, though mixed with superstition, were advanced for his age; hero of Browning's poem 'Paracelsus'.
**Parachute** (*păr'ȧ-shụt*), **2674–5;** folded, *picture,* **317.**
**Paradise birds, 2674, 2676.**
**'Paradise Lost',** epic poem by Milton, **2243, 1165;** story of, **2244–6.**
**Paradox Valley,** in Colorado and Utah; carnotite deposits, **841,** *picture,* **2960.**
**Par'affin, 2676, 3706;** melting point, **1362;** process of obtaining, **2753–4.**
**Paraform,** form of formaldehyde, **1331.**
**Paraguay** (*păr'ȧ-gwā*), a country of S. Amer.; 65,000 sq. mi.; pop. 1,000,000; cap., Asuncion; **2676–7,** *maps,* **3608, 3288–9;** disputes with Bolivia, **448;** Plata R., **2831;** products and industries, **2677;** war with Uruguay, **3608;** women cigar-makers, *picture,* **3287;** yerbe maté, **3451,** *pictures,* **3286.**
**Paraguay River,** chief tributary of the Parana; rises in s.w. Brazil, flows s. through Paraguay; length about 1500 mi.; chief commercial outlet for Paraguay; **494, 2676,** *map,* **3288–9.**
**Paraguay tea.** Same as **Maté.**
**Par'allax,** of stars, **3341;** of Eros, **237.**
**Parallelepi'ped,** in geometry, **1425.**
**Parallel'ogram,** in geometry, **1425.**
**Parallelogram of forces, 4028.**
**Par'allels,** in geomctry, **1424–8;** of latitude, **1968.**
**Paral'ysis,** caused by brain injury, **491–2.**
**Paramaribo** (*păr-ȧ-măr'ĭ-bō*), cap. and trade center of Dutch Guiana, S. Amer.; pop. 36,000; on estuary of Surinam R. 17 mi. from sea; good harbor, 2 forts; **1547.**
**Parana** (*pä-rä-nä'*), 2d largest r. of S. Amer.; rises in s.-cent. Brazil; flows s.w. nearly 2000 mi.; **494, 2831, 2676,** *maps,* **3288–9.**
**'Parana',** Brazilian steamer, **496.**
**Parasites** (*păr-ȧ-sīts*), **2677–80, 396;** barnacles, **331;** disease germs, **1449–52;** fleas, **1292;** flies and ticks, **1313;** fungi, **1382, 2823,** *picture,* **2821;** hookworm, **1679;** ichneumon flies, **1724;** inquiline bees, **364;** leeches, **1984–5;** mildews and molds, **2235–6;** mistletoe, **2274;** mosquitoes, **2334–8;** rusts and smuts, **3099–3101;** scale insects, **3132–3;** worms, **3813, 3814.**
**Par'asitism,** defined, **396.**
**Parasol ants, 142,** *picture,* **141.**
**Parathy'roid,** a gland, **1469, 1470.**
**Par'avane,** device to protect ships from mines, **3520.**
**Parcae** (*păr'sē*), Latin name for the three Fates, **1225.**
**Parcel post, 2894;** established in U.S., **3428;** mailable matter, **2898.**
**Parchment,** writing material made of goat, sheep, or calf skin, **2667;** in bookmaking, **455–6.**
**Parchment Lactarius,** a mushroom, color plate facing **2374.**
**Parchment paper, 2673.**
**Pardon,** for prisoners, **2920.**
**Parenchyma** (*pȧ-rĕn'kĭ-mȧ*), parent tissue of plants; of leaves, **1982.**
**Paren'thesis,** use of, **2936.**
**Pargol,** a rubbery gum, **890.**
**Pariahs** (*pā'rĭ-ȧs*), outcasts among Hindus, **1750–1.**
**Par'idae,** chickadee family, **412;** chickadee, **728;** titmouse, **3505–6.**
**Parini** (*pä-rē'nē*), **Giuseppe** (1729–99). Ital. poet, criticized society in beautiful blank verse; 'Il Giorno'.
**Paris** (*păr'ĭs*), Trojan warrior, **2680, 3542.**
**Paris,** cap. of France, 3d largest city in world; pop. 2,890,000; **2681–5, 1348;** history, **2685, 2526, 2762, 3702, 1368, 2396, 1356;** Louvre, **1198, 2684, 2372,** *pictures,* **1200, 1203, 2371;** national library, **1992;** Notre Dame, **2682, 2762,** *pictures,* **185, 186;** Versailles, **3633.**
**Paris,** Tex. City 95 mi. n.e. of Dallas; pop. 15,040; large trade in cotton; cotton products and flour.
**Paris, Declaration of** (1856), **3530.**
**Paris, plaster of, 1554, 2904, 3154.**
**Paris, Treaties of:** (1763), **3180, 1352;** (1783), **3004, 1880;** (1856), **3080;** (1898), **3307.**
**Paris, University of,** one of the largest and oldest universities in the world; important in Middle

Ages, gradually declined until abolished at Fr. Rev.; reëstablished 1896; faculties of letters, science, theology, law, medicine; early years, **831, 832, 2684;** early postal system, **2896.**

**Paris Basin, 1345, 1192;** wheat, **1346.**

**Paris green, 220, 3331.**

**Par'ish,** unit of govt. in Louisiana, **2072.**

**Park, Mungo** (1771–1806). Scotch explorer of Africa, discoverer of the Niger R. ('Travels in the Interior of Africa').

**Park College.** At Parkville, Mo.; co-ed., Presb.; founded 1875; liberal arts, music.

**Parker, Alton Brooks** (born 1852), Amer. lawyer and Democratic leader, b. Cortland, N.Y.; N.Y. Supreme Court 1885–1904; defeated for president, **3060.**

**Parker, Sir Gilbert** (born 1862), Brit. novelist, born in Canada, **2685–6, 624.**

**Parker, Horatio William** (1863–1919), Amer. composer; chief works, **2381.**

**Parker, Louis N.** (born 1852), Eng. dramatist ('Pomander Walk'; 'Disraeli', played by George Arliss); Sherborne pageant, **2625.**

**Parker, Theodore** (1810–60). Amer. rationalist preacher and social reformer, active and ardent abolitionist, b. Lexington, Mass.

**Parkersburg,** W. Va., on Ohio R., 75 mi. s.w. of Wheeling; pop. 20,050; in clay, coal, and oil region; oil refineries, foundries and machine shops, flour and lumber mills; **3723, 2573.**

**Parkin, Sir George Robert** (1846–1922). Brit. educator, b. Salisbury, New Brunswick; advocate of imperial federation, organizer and secretary of Rhodes Scholarship Trust.

**Parkman, Francis** (1823–93), Amer. historian, **2686, 470, 114.**

**Park Mts.,** range in cent. Colo., **3036.**

**Park Row,** famous street of New York City, **2490,** *picture,* **2492.**

**Parks, national.** *See in Index* **National parks.**

**Parlement** (*pärl-mäⁿ'*) **of Paris,** supreme royal tribunal of France, originating in medieval court; through registration of laws exercised considerable influence over king; abolished 1790; **1367.**

**Parliament** (*pär'lĭ-mĕnt*), Canadian, **620–2.**

**Parliament,** in France. *See in Index* **National Assembly.**

**Parliament,** Gt. Brit., **2687–9, 555;** origin, **2687, 1153, 2317;** growth of power, **1087, 1088, 3016, 1959, 1634;** conflicts with Stuart kings, **1860–1, 692–3;** Long Parliament, **2689, 693, 924, 925, 1570;** Rump Parliament, **2689, 924, 925;** Bill of Rights (1689), **393;** position strengthened by Whigs, **2869;** administration of Amer. colonies, **3000–2;** Reform Bill (1832), **2688, 3083, 2869;** Catholic disabilities removed, **2559, 1810;** later electoral reforms, **2688;** power of Lords limited, **2688, 2040;** women admitted, **3779.**

**Parliament,** Irish, **1810, 1811.**

**Parliament, Houses of,** London, **2054,** *pictures,* **2049, 2687.**

**Parliamentary government,** compared with congressional govt., **862;** Canada, **620–1.**

**Parliamentary law,** defined, **1972.**

**Parliament Buildings,** Ottawa, Ontario, **2604,** *picture,* **621.**

**Parma** (*pär'mä*). Italy, town 88 mi. n.w. of Florence on Parma R.; pop. 55,000; varied mfrs., farming trade; famous art works; univ.; home of Correggio; annexed by Napoleon I, **2394;** joins united Italy, **1837.**

**Parmentier** (*pär-môⁿ-tyā'*), **Antoine** (1737–1813), Fr. scientist; promotes cultivation of potato, **2900.**

**Parmesan** (*pär-mē-zăⁿ'*) **cheese, 709.**

**Parnas'sus, Mt.** (modern Liakoura), in cent. Greece, **1517, 1528;** oracle of Delphi, **991;** resting place for Deucalion's ark, **1000;** sacred to Apollo and Muses, **156.**

**Parnell', Charles Stewart** (1846–91), Irish political leader, **2689–90.**

**Par'nes, Mount,** modern Ozea, in Greece, 15 mi. n. of Athens; 4600 ft.; **249.**

**Parole** (*pȧ-rōl'*) **system,** for relcase of prisoners, **2920.**

**Paros** (*pā'rŏs*) or **Paro,** Gk. isl. of Cyclades group in Aegean Sea just w. of Naxos; 96 sq. mi.; formed by Mt. Elias (2500 ft.); celebrated white marble quarries; **1528, 2144.**

**Parr, Catherine** (1512–48), 6th queen of Henry VIII of England; tactful, kindly woman to whose influence her step-children, the future sovereigns Edward VI, Mary, and Elizabeth, owed much; **1636.**

**Parr,** a young salmon, **3113.**

**Par'rakeet,** a small parrot, particularly certain species with long, wedge-shaped tail; Carolina, **2690.**

**Parrhasius** (*pă-rā'shĭ-ŭs*), Gk. painter of 4th cent., first master of correct drawing, and first to use light and shade to express round form; won contest with Zeuxis: **1529.**

**Parrish, Maxfield** (born 1870). Amer. painter, illustrator, and mural decorator, b. Philadelphia (illustrations for 'Arabian Nights' and other classics).

**Parrot,** a tropical bird, **2690;** African home, **34;** altitude range, *picture,* **397;** care as pet, **2758;** cockatoos, **817;** head, *picture,* **410;** length of life, **126;** macaws, **2094.**

**Parry, Sir Charles Hubert Hastings, Baronet** (1848–1918). Eng. composer; series of great choral works with orchestra ('Blest Pair of Sirens', 'Invocations to Music', etc.); professor of music at Oxford 1900–08; author of 'Studies of Great Composers' and 'Art of Music'.

**Parry, Sir William Edward** (1790–1855). Eng. Arctic explorer; made three attempts to cross Northwest Passage; in 1827 tried to reach North Pole, attaining latitude 82° 45′ N., which remained for 49 years the "farthest north" reached by explorers.

**Parry Sound,** Ontario. Port on inlet of Georgian Bay; pop. 8500; summer resort, with numerous isls.; makes lumber and lumber products, wood alcohol; during World War large munitions plant.

**Parsees** (*pär'sēz*), followers of Zoroaster in India, **451, 3841,** *picture,* **1752;** sacred fires, **1250.**

**Parsifal** (*pär'sĭ-fȧl*) or **Perceval,** in Arthurian legend, innocent ignorant boy who becomes a knight-errant, withstands temptation, achieves the quest of the Holy Grail, thus delivering a stricken land and king; knight of the Round Table, **3068;** father of Lohengrin, **2047;** Wagner's opera, **3663.**

**Parsley,** an herb with aromatic leaves, **3319, 3317;** related to carrots and celery, **650, 671;** when and how to plant, **1397.**

**Parsley family.** Same as *Apiaceae.*

**Parsnip River,** in e.-cent. Brit. Columbia; flows n. 175 mi. and joins Finlay R.; **2699.**

**Parsnips,** garden plants of the parsley family, **2691;** when and how to plant, **1397.**

**Parsons,** Kan. City 125 mi. s.w. of Kansas City; pop. 16,028; commercial center of agricultural region; grain elevators, creameries, flour and feed mills, foundry, r.r. shops.

**Parsons College.** At Fairfield, Iowa; co-ed., Presb.; founded 1875; classics, sciences, philosophy, normal and business courses.

**Parsons turbine, 3554.**

**Parthenogen'esis,** reproduction from unfertilized egg cells; among insects, **1786, 154.**

**Par'thenon,** at Athens, **11–12, 251, 1201, 177,** *pictures,* **176–7, 11;** Elgin marbles, **1530, 2056,** *picture,* **1525;** frieze, *pictures,* **1532, 248, 1206;** meaning of name, **249;** Pericles, **1530, 2760.**

**Parthia** (*pär'thĭ-ȧ*), anc. country of Asia s.e. of Caspian Sea; most extensive sway under Mithridates I; Parthians' favorite tactics were to discharge arrows as they retreated —hence "Parthian shot"; **1657, 2738,** *map,* **3042.**

**Partial** or **overtone,** in music, **3278.**

**Participating preferred stock, 3359.**

**Par'ticiple,** in grammar, **3628.**

**Partington, Mrs.** Eng. anecdotal character, said to have tried to mop up a tidal wave; used as pen name by Benjamin P. Shillaber (1814–90), Amer. humorist.

**Partin'ium,** an alloy, **3548.**

**Partition,** in arithmetic, a method of division, **1015–6.**

**Partnership,** distinguished from corporation, **893.**

**Partridge,** name given various birds of the grouse family; "bobwhite," or American quail, **2943;** incorrectly applied to ruffed grouse, **1544.**

**Parts of speech, 1493–4.** *See also in Index* under separate names, as **Adjective,** etc.

**Par value,** of stocks and bonds, **3358.**

**Pasade'na,** Calif., residential city and winter resort, 8 mi. n.e. of Los Angeles; pop. 45,354; founded 1882; fruit-growing and mfg. interests; California Institute of Technology; Mount Wilson Observatory, **2552, 3463;** orange grove, *picture,* **1377.**

**Pasargadae** (*pă-sär'gą-dē*). Anc. cap. of Persia, said to have been built by Cyrus the Great on site of his great victory over Astyages (6th cent. B.C.); contained tomb of Cyrus.

**Pascagou'la River,** Miss., navigable stream 85 mi. long formed by junction of Chickasawhay and Leaf rivers, *map,* **2262.**

**Pascal** (*päs-kȧl'*), **Blaise** (1623–62). Fr. philosopher, mathematician, and physicist ('Thoughts'; 'Provincial Letters', best example of "polite, controversial irony" since Lucian); **1365;** invents first calculating machine, **572;** states law of fluid pressure, **1710.**

**Pash'a butterfly,** two-tailed caterpillar, *picture,* **660.**

**Pasig** (*pä'sĭg*) **River,** Philippines, short r. in s. end of Luzon; flows 15 mi. from Laguna de Bay through Manila into Manila Bay, **2136.**

**Passa'ic,** N.J., mfg. and residential city 13 mi. n.w. of New York City, on Passaic R.; pop. 63,841; textiles, rubber, dyes, chemicals; several engagements in Rev. War; **2458.**

**Passaic River,** in n.e. New Jersey, emptying into Newark Bay; immense water-power; about 100 mi. long; **2448, 2694.**

**Pass'ant,** in heraldry, **1639.**

**Passau** (*pä'sou*), old town of Bavaria, Germany, at junction of Danube, Inn, and Ilse, 90 mi. n.e. of Munich; pop. 22,000; Treaty of Passau (1552) granted religious freedom to Lutherans; **1442.**

**Passchendaele** (*päs'kĕn-dä-lē*) **Ridge,** height 6 mi. n.e. of Ypres; World War battles, **3797, 3810.**

**Pass Christian,** Miss., town and winter resort 70 mi. due s. of Hattiesburg on Gulf of Mexico; pop. about 3000; **2264.**

**Passenger pigeon, 2803.**

**Passeres** (*păs'ēr-ēz*), the order of perching birds, **412,** *pictures,* **417–20.**

**Passion flower,** or maypop, **2691;** pollen grain, *picture,* **1309.**

**Passionists** (Congregation of the Discalced Clerks of the Most Holy Cross and Passion of our Lord Jesus Christ), religious order founded in Italy 1720; vows, **2302.**
**Passion Play,** dramatic representation of sufferings of Christ; first given by villagers of Oberammergau in 17th cent. in gratitude for escape from plague of 1633; **347, 2259, 1436.**
**Passion** or **Holy Week, 1070.**
**Passover,** Jewish holiday, **2691;** influenced Easter customs, **1070;** Last Supper, **1888.**
**Passport, 2691–2.**
**Passy** (*pä-sē'*), France, suburb of Paris on w., adjoining Bois de Boulogne; artesian well, **222.**
**Pasteur** (*päs-tûr'*), **Louis** (1822–95), Fr. chemist and bacteriologist, **2692,** *picture,* **2693;** germ theory of disease, **2652–3, 399, 150;** his humility, **1697;** at Lille Univ., **2008;** study of tartrates, **3438.**
**Pasteuriza'tion, 2692, 953.**
**Pasture lands, 1503.**
**Patago'nia,** a region in S. Amer., **2692, 190, 3285,** *maps,* **3288–9, 191;** Andes Mts., **122;** native superstition, **2117–8.**
**Patapsco** (*pă-tăps'kō*) **River,** in n. Maryland, 80 mi. long; enters Chesapeake Bay 14 mi. below Baltimore, **322,** *map,* **2162.**
**Patching,** in sewing, **3186.**
**Pâté de foies gras** (*pä-tā' dē fwä grä*), **1487.**
**Patent flour, 1302, 1303.**
**Patent leathers,** how prepared, **1977.**
**Patent medicines,** danger of, **1715.**
**Patent Office,** U.S., **2692, 2694,** *picture,* **3600;** trade marks, **884.**
**Patents, 2692, 2694;** differ from trade-mark, **884;** effects on shoe industry, **3222.**
**Pater** (*pā'tĕr*), **Walter** (1839–94), Eng. essayist, refined and subtle stylist ('Marius the Epicurean'; 'Imaginary Portraits'), **1167.**
**Paterson, William** (1745–1806), Amer. statesman and jurist, b. Ireland; atty.-gen. of N.J. 1776–86; U.S. senator 1789–90; gov. of N.J. 1791–93; associate justice Supreme Court from 1793 until his death; Paterson, N.J., named in his honor; at Constitutional Convention, **3593.**
**Paterson, William** (1658–1719). Scotch financier, founder of the Bank of England; promoter of a disastrous attempt to colonize Darien (Panama) in 1698.
**Paterson,** N.J., chief silk-mfg. city of New World; pop. 135,875; **2694.**
**Pathfinder.** In James Fenimore Cooper's novel 'The Pathfinder', nickname of Natty Bumppo, the hero.
**Pathfinder Reservoir,** Neb., **2430, 1829.**
**Pathol'ogy,** science dealing with disease, **2192, 121;** of plants, **473.** *See also in Index* **Disease; Germ Theory of Disease.**
**Patio** (*pä'tē-ō*), inner court of a Span. or Span.-Amer. dwelling, **3286, 3181, 3125.**
**Pat'more, Coventry** (1823–96). Eng. poet and critic ('The Angel in the House'; 'The Unknown Eros'—odes of exalted thought expressed in rich, dignified melody).
**Pat'mos.** Bare volcanic isl., one of the Sporades in Aegean Sea; here St. John (the evangelist) lived for 18 months in exile and here he is said to have written the Apocalypse.
**Patna** (*pŭt'nȧ*), British India, commercial center in Bengal on Ganges R. 290 mi. n.w. of Calcutta; pop. 136,000; opium, indigo; univ. (founded 1917); massacre of Patna 1763, and Sepoy Mutiny 1857; **1745.**
**Patras** (*pă'trăs*), Greece. Fortified seaport and trade center on w. coast on Gulf of Patras; pop. 40,000; one of 12 Achaean cities; early center of Christianity; cradle of Gk. revolution 1821.
**Patriar'chal system, 1223.**
**Patricia** (*pȧ-trĭsh'ȧ*), **Princess.** *See in Index* **Ramsay, Lady Patricia.**
**Patricians,** aristocratic class of Rome, **3042–4, 1223.**
**Pat'rick, Saint** (389?–461), apostle to Ireland and its patron saint, **2694–5, 1808, 2299, 3195.**
**Patrick, Order of Saint, 979.**
**Patriot'ic societies,** U.S., **2695.**
**'Patriotism',** a Little Talk by Arthur Mee, **2696–7;** flag, **1287, 1288;** in literature, **116;** meaning of word, **1223;** poem, 'The Flag Goes By', **1288;** story, 'The Man Without a Country', **1562–5.**
**Patroclus** (*pă-trō'klŭs*), hero of Trojan War in Gk. myth., friend of Achilles, **8, 9;** killed by Hector, **1626.**
**Pa'trons of Husbandry,** popularly called "Grangers" because the society was divided into "granges" or lodges, **879, 2871.**
**Patronym'ics** ("father-names"), origin of, **2388–9.**
**Patroon'.** The proprietor of a manor or semifeudal estate granted under the old Dutch govts. of N.Y. and N.J.; privileges abolished 1850.
**Patterson, A. B.** (born 1864), Australian poet, **268.**
**Patterson, Elizabeth** (1785–1879), first wife of Jérôme Bonaparte, **452.**
**Patti** (*păt'ĭ*), **Adelina, Baroness Cedarström** (1843–1919). Operatic soprano celebrated in many countries for her wonderfully pure voice, which kept its freshness even in her later years; made debut as "Lucia" in New York City at 16; last appeared in U.S. 1911.
**Pau** (*pō*). Winter health resort of s.w. France 55 mi. s.e. of Bayonne; pop. 37,000; anc. cap. of Navarre; chateau (1360) was chief residence of sovereigns of Navarre and birthplace of Henry IV.
**Paul I** (1754–1801). Czar of Russia; succeeded his mother, Catherine II, in 1796; cruel despot and madman; assassinated by conspiracy of nobles.
**Paul,** popes. For list *see in Index* **Pope.**
**Paul III (Alexander Farnese)** (1468–1549), pope, elected 1534; excommunicated Henry VIII of England; commissioned Michelangelo to paint the 'Last Judgment'; and Inquisition, **1780.**
**Paul IV (Giovanni Pietro Caraffa)** (1476–1559). Pope, elected 1555; opposed Reformation and made breach between churches of England and Rome impassable.
**Paul, Saint** (d. about 67 A.D.), "the Apostle of the Gentiles," first great Christian missionary (name originally Saul), **2698, 157;** in Athens, **251;** converted at Damascus, **956,** *picture,* **954;** at Corinth, **886;** in Cyrus, **947;** Epistle to Galatians, **674;** Epistle to Thessalonians, **3114;** in Rome, **768, 3052.**
**Paul, Alice** (born 1885), woman suffragist, b. Moorestown, N.J.; imprisoned 3 times in England and 3 times in U.S. for woman suffrage activities; **3779.**
**Paul, Jean.** *See in Index* **Richter, Johann Paul Friedrich.**
**Paul, Epistles of,** books in New Testament comprising 13 letters by Apostle Paul—Romans, I and II Corinthians, Galatians, Ephesians, Philippians, Colossians. I and II Thessalonians, I and II Timothy, Titus, and Philemon (Hebrews sometimes included); **2698.**
**Paulding, Hiram** (1797–1878). U.S. admiral; burned Norfolk Navy Yard April 1861 to prevent its falling to Confederates.
**'Pauline',** poem by Browning, **517.**
**Paul of Thebes** (3d cent.), a hermit, **2298.**
**Paul Veronese.** *See in Index* **Veronese, Paul.**
**Pauperism, 2878–9.**
**Pausanias** (*pą-sā'nĭ-ăs*) (5th cent. B.C.). Spartan general and regent; led Gk. forces to victory at Plataea 479 B.C.; ambition then led him to treason; died walled up in temple where he had taken refuge, his mother bringing the first stone.
**Pausanias** (2d cent. A.D.), Gk. traveler, geographer, and writer on art, **1538;** visits Acropolis, **12.**
**Pavia** (*pä-vē'ä*) (anc. Ticinum). City of n. Italy 18 mi. s. of Milan on Ticino R.; pop. 41,000; univ.; cap. of Lombard kingdom; taken by Charlemagne 774; Charles V here defeated and took Francis I of France prisoner (1525).
**Paving materials, 3026–7.**
**Pawn,** betel nut preparation, **387.**
**Pawn,** in chess, **716, 717, 718.**
**Pawnees** (*pą-nēz'*), tribe of Plains Indians, formerly roving about Nebraska in Platte R. valley, **1767;** moved to Indian Territory, **2576.**
**Pawpaw.** Same as **Papaw.**
**Pawtuck'et,** R. I., city 4 mi. n. of Providence; pop. 64,248; textiles, foundry products, machinery; first cotton mill in U.S., **3007;** *picture,* **3008.**
**Pawtucket River,** R. I., lower course of the Blackstone, *picture,* **3008.**
**Pawtux'et River,** R.I., **3007,** *map,* **3009.**
**Pax Romana,** "Roman peace," **3047.**
**Payne** (*pān*), **John Howard** (1791–1852). Amer. actor and dramatist, remembered as author of 'Home, Sweet Home'.
**Payne, Sereno Elisha** (1843–1914). Amer. lawyer and political leader, b. Hamilton, N.Y.; served in national House of Representatives almost continuously from 1883 until his death; one of the framers of the Payne-Aldrich Tariff Act.
**Payne-Aldrich tariff, 3437;** Taft defends, **3428.**
**Pea,** a climbing pod-bearing plant. **2698;** food value, **2238;** rich in protein, **2926;** seed structure, **3173;** when and how to plant, **1397.** For pea family of plants *see in Index* **Legumes.**
**Pea, sweet, 3405.**
**Peabody, Elizabeth Palmer** (1804–94), Amer. educator and writer, b. Billerica, Mass.; studied Greek under Emerson, taught under Amos Bronson Alcott; introduces Froebel's methods into U.S., **1925.**
**Peabody, George** (1795–1869). Amer. merchant, banker, and philanthropist, b. Danvers, Mass.; amassed fortune in London and gave millions to various causes—Grinnell polar expedition, Peabody Institute at Baltimore, Peabody Education Fund, dwellings for London working people, etc.
**Peabody, Josephine Preston** (Mrs. L. S. Marks) (born 1874). Amer. poet and dramatist, b. New York ('The Piper'; 'The Singing Man'; 'Marlowe'; 'The Wolf of Gubbio').
**Peabody,** Mass. Industrial city 2 mi. w. of Salem; pop. 19,552; plain and morocco leather mfrs., tanning machinery, shoes, marine hardware; Peabody Institute.
**Peabody Education Fund, 1610.**
**Peabody Institute,** Baltimore, **322.**
**Peace Conference** of 1919, at close of World War, **3808, 3811–2, 3633, 1662;** Borden, **467;** Clemenceau, **787;** Lloyd George, **2041;** Smuts, **3254;** Venizelos, **3626;** Wilson, **3748–9.** *See also in Index* **World War; League of Nations.**
**Peace conferences, Hague, 1559, 1558, 172.**
**Peace movement:** arbitration, **172–3;** Bryan, **521;** Carnegie's contributions, **646, 1558;** Hague conferences, **1559, 1558, 172;** League of Nations, **1974.**

**Peace Palace,** at The Hague, *picture,* **1558.**
**Peace River,** in n.w. Canada, **2698–9.**
**Peace treaties.** *See in Index* **Treaties.**
**Peach,** **2699;** classification, **716, 1380, 3533;** Michigan orchard, *picture,* **2223;** original home, **232.**
**Peach Tree Creek.** Indecisive Civil War battle fought near Atlanta, Ga., July 1864, between Federals under General Sherman and Confederates under General Hood.
**Peacock, Thomas Love** (1785–1866). Eng. satirical novelist and poet, friend of Shelley ('Nightmare Abbey'; 'Crotchet Castle').
**Peacock,** **2699–2700;** altitude range, *picture,* **397;** iridescent feathers, **1229;** sacred to Hera, **1802;** superstition about plumes, **1229.**
**'Peacock',** Brit. sloop-of-war; Lawrence captures, **1973.**
**Peacock butterfly,** *picture,* **548–9.**
**Peacock Throne,** Delhi, **990.**
**Pea-crab, 912.**
**Peahen,** a female peacock, **2699.**
**Peale** (*pēl*), **Charles Wilson** (1741–1827), Amer. portrait painter, **2634.**
**Peanut,** underground fruit of a bean-like plant, **2700–1;** oil, **1227;** protein content, **2926;** in Virginia, **3648, 2513.**
**Pear, 2701;** classification, **3533.**
**Pear, alligator, 1378.**
**Pear, prickly, 562, 563.**
**Pea Ridge.** Civil War battle fought at Pea Ridge (Ozark Mts.) in n.w. Arkansas, March 7–8, 1862; first victory of Union troops w. of Mississippi; saved Missouri to Union cause.
**Pearl ash, 2900.**
**Pearl buttons, 549, 3202.**
**Pearl Harbor,** Hawaiian Isls., **1603,** *map,* **1604.**
**Pearl Mosque,** in Delhi, **990.**
**"Pearl of the Desert," 954.**
**"Pearl of the East Indies," 1877.**
**Pearl River,** or Shu-kiang, China. Same as **Canton River.**
**Pearl River,** Miss., stream 350 mi. long, forming part of e. boundary, *map,* **2262.**
**Pearls,** **2702–3;** Australian fisheries, **264;** contain calcium carbonate, **571;** Ceylon fisheries, **685;** in Mississippi R., **1806;** pearl oyster, *picture,* **2615;** Persian Gulf, **2738.**
**Pearl sago, 3104.**
**Pearl type, 3572.**
**Pearly nautilus,** shell, *picture,* **3203.**
**Pearson, Weetman Dickinson.** *See in Index* **Cowdray.**
**Peary,** (*pē'ri*), **Robert Edwin, Rear Admiral** (1856–1920), discoverer of North Pole, **2703–4, 2862;** routes of voyages, *maps,* **1540, 189.**
**Peasants' Revolt,** in England (1381), **3571–2, 3016, 3249.**
**Peasants' Revolt,** in Germany (1525), **2987, 1448.**
**Peat,** partly carbonized vegetable material, **2704–5;** changed to coal, **811;** formed by moss, **2340;** in glaciated areas, **1721.**
**Pebbles,** how formed, *picture,* **2408.**
**Pecan',** a N. Amer. tree of the hickory family, **2705–6, 2545, 3534.**
**Pec'cary,** small wild hog of N. and S. Amer., **2706,** *picture,* **1671;** foot, *picture,* **1323.**
**Pechora,** r. of n. Russia, rising in Ural Mts. and flowing 970 mi. to n. coast, **1188.**
**Peck,** a unit of measure, **3715.**
**Pecksniff, Seth.** In Dickens' 'Martin Chuzzlewit', a canting hypocrite.
**Pecos** (*pā'kōs*) **River,** chief tributary of Rio Grande; rises in New Mexico at base of Baldy Peak; flows s. and s.e. 800 mi. entering Rio Grande on Texas-Mexican border; **3022, 2464, 2465,** *maps,* **2465, 3478.**
**Pécs** (*pāch*) (Ger. *Fünfkirchen*), Hungary. Town 105 mi. s.w. of Budapest; pop. 50,000; fine mediaeval cathedral; makes woolens, leather, paper, porcelain; surrounding vineyards produce famous wine.
**Pec'toral muscle,** *picture,* **2372.**
**Ped'agogy.** *See in Index* **Education.**
**Pedals, organ, 2600;** piano, **2801;** piano-player, *picture,* **2798.**
**Pedee** (*pē'dē*) **River,** in S. Car., continuation of the Yadkin, *maps,* **3291, 2518.**
**Pedersen, Christiern** (1480?–1554). "Father of Danish literature"; his translation of the Bible, called 'Christian III's Bible', is landmark in Scandinavian literature.
**Pedicle** (*pĕd'ĭkl'*) or **pedicel** (*pĕd'ĭ-sĕl*), of spider, **3326.**
**Ped'iment,** in classic architecture, triangular-shaped portion of wall above the cornice, corresponding to gable in Gothic architecture; *picture,* **180;** of Parthenon, **11,** *picture,* **176–7.**
**Ped'ipalp,** grasping claw of arachnids; in spiders, **3326.**
**Pedro** (*pē'drō*) **III** (1236–86), king of Aragon; called "the Great" because of success in conquering Sicily; **3230.**
**Pedro I** (1798–1834), emperor of Brazil, son of John VI of Portugal, crowned 1822; succeeded to Port. crown 1826, and at once resigned it to daughter Maria da Gloria; abdicated Brazilian crown 1831; died after restoring his daughter to Port. throne; **496.**
**Pedro II** (1825–91), emperor of Brazil; succeeded 1831; compelled to abdicate 1889; prosperous reign notable for emancipation of slaves and war (1864–70) with Paraguay; **496.**
**Pedro I, the Cruel** (1333–69). King of Castile and Leon; succeeded 1350; provoked rebellion of his brother Henry, by whom he was killed.
**Pedro V** (1837–61). King of Portugal; succeeded 1853; reign marked by freedom from civil strife and by economic improvement.
**Peek'skill,** N.Y. Port on Hudson R. 40 mi. n. of New York City; pop. 15,868; makes stoves, hats, garments, pearl beads, yeast; several preparatory schools.
**Peel, Sir Robert** (1788–1850), Brit. statesman, **2706, 907–8;** splits Conservatives, **2869;** Disraeli on, **1013;** Gladstone supports, **1468;** Irish question, **2559;** Oxford career, **2608;** police system, **2865.**
**Peele, George** (1558–98). Eng. dramatist and poet ('The Old Wives' Tale'; 'The Love of King David and Fair Bethsabe'); shares with Marlowe credit for improving English dramatic diction and making blank verse smoother.
**"Peeler,"** Eng. nickname for police, **2706, 2865.**
**"Peeper" frog, 1375.**
**Peeping Tom, 910.**
**'Peer Gynt'** (*pā'ĕr gŭnt*), Ibsen's poetic drama, whose hero, a character derived from Norwegian folklore, is a kind of Norse Faust; music by Grieg, **1542.**
**Pegasus** (*pĕg'ă-sŭs*), in Gk. myth., winged horse of Muses, **2706–7.**
**Pegasus bird-wing butterfly,** pupa, *picture,* **661.**
**Peiho** (*pā-hō'*), important r. of n. China; rises n. of Peking, flows s. e. 350 mi. to Gulf of Pĕchili; at Tientsin, **3498.**
**Peipus** (*pā'ĕ-pŭs*). Large lake 120 mi. s.w. of Petrograd on Esthonian-Russian boundary; drains into Gulf of Finland through Narova R.; 1356 sq. mi.; rich fisheries.
**Peisistratus.** Same as **Pisistratus.**
**Pek'an,** or black marten, **2156;** fur, **1390.**
**Pe'kin,** Ill. City 10 mi. s. of Peoria on Illinois R.; pop. 12,086; grain and coal trade; varied mfrs.
**Peking',** cap. of China; pop. between 700,000 and 1,000,000; **2707–8, 746;** Boxer Rebellion, **748;** camel caravan, *picture,* **590;** Ming tombs, **2708,** *picture,* **739;** Mongols capture, **2285.**
**Pelag'ic sealing, 3168.**
**Pelargo'nium,** a flowering plant, **1435.**
**Pelecypods** (*pĕ-lĕs'ĭ-pŏdz*), class of mollusks including clams and oysters, **2280, 3945.**
**Pelée** (*pā-lā'*), **Mont,** volcano in Martinique, **2156.**
**Peleus** (*pē'lūs*), in Gk. myth., husband of Thetis and father of Achilles; marriage feast, **3542.**
**Pelew** (*pĕ-lū'*) **Islands,** group of 26 small fertile isls. in Pacific e. of Philippines; discovered by Spanish 1543; sold to Germany 1899; seized by Japan in 1914; *map,* **2624–5;** fertility, **2620;** Japanese mandate, **2624.**
**Pe'lias,** Gk. myth., son of Poseidon and king of Iolcus; sends Jason in search of Golden Fleece, **193.**
**Pel'ican,** a fish-eating water bird, **2709,** *picture,* **2411;** brown, *picture,* **413;** foot, *picture,* **409.**
**Pelican fish,** *picture,* **1273.**
**Pelican Island,** Fla., **2709, 426.**
**Pelican State, 2068.**
**Pelion** (*pē'lĭ-ŏn*), **Mt.** Lofty mt. range in Thessaly, Greece, celebrated in myth.; had temple to Zeus and cave of Centaur Chiron; giants are said to have attempted to pile Pelion on Ossa to scale summit of Olympus, the abode of the gods; ship *Argo* built from wood on its slopes.
**Pel'la,** cap. of Macedon under Philip II and Alexander the Great, **86, 2096.**
**Pella'gra,** an acute chronic disease, not contagious or hereditary, causing severe nervous and physical disturbances; cause, **1450, 3652, 1322;** common in Italy, **1838.**
**'Pelléas et Mélisande'** (*pĕl'lā-ăs ā mā-lē-zänd'*), opera, **2584.**
**Pelly,** river flowing w. across s. Yukon about 350 mi., **3835.**
**Pelopidas** (*pē-lŏp'ĭ-dăs*) (d. 364 B.C.), Theban statesman and general, friend and associate of Epaminondas and his aid at Leuctra.
**Peloponne'sian Wars, 1524–5, 3310, 251;** Pericles, **2730.**
**Peloponnesus** (*pĕl-ō-pō-nē'sŭs*), anc. name of s. Greece (modern Morea), **1517,** *maps,* **1518;** Sparta wins control, **3310, 1522.**
**Pelops** (*pē'lŏps*), in Gk. myth., son of Tantalus, king of Phrygia and father of Atreus and Thyestes; Pelops' line was cursed by Myrtilus, the charioteer to whom he refused to pay a promised bribe; "Pelops' island," **1517.**
**Pelo'rus Sound,** New Zealand, **131.**
**Pelusium** (*pĕ-lū'shĭ-ŭm*). Anc. fortified city of Egypt at n.e. extremity of Delta of Nile; gave name to e. mouth of Nile; important point in wars between Egypt and Sennacherib, Cambyses, Antiochus, and other Eastern monarchs.
**Pel'vis,** in human skeleton, **3245.**
**Pem'ba,** isl. of the Zanzibar Protectorate, off the e. coast of Africa; about 300 sq. mi.; pop. 83,109; **3838, 1068,** *map,* **1069.**
**Pem'berton, John Clifford** (1814–81), Confederate general; surrenders Vicksburg, **3637.**
**Pem'bina Mts.,** N.D., **2522.**
**Pembina River,** N.D., **2522,** *map,* **2524.**
**Pem'broke, Mary Sidney, Countess of** (1561?–1621). Sister of Sir Philip Sidney, for whom he wrote 'The Countess of Pembroke's Arcadia'; subject of Ben Jonson's famous epitaph on "Sidney's sister, Pembroke's mother."
**Pembroke, Richard de Clare, Earl of.** *See in Index* **Strongbow.**

**Pembroke.** Cap. of Pembrokeshire, Wales, in s. on estuary, Milford Haven; pop. 16,000; chief industries connected with Pembroke Dock, fortificd naval dockyard near by; ruined 11th cent. castle, reputed birthplace of Henry VII.
**Pembroke College,** Oxford, founded, **2610.**
**Pem'mican,** an Indian food, **430.**
**Pen, 2709–12;** ink, **1779–80;** "siphon" pen, **558.**
**Pen'ance,** defined, **764.**
**Penang** (*pē-nāng'*), Isl. (called officially Prince of Wales Isl.) at n. end of Straits of Malacca, off the w. coast of Malay Peninsula; 108 sq. mi.; with region on mainland forms one of Brit. Straits Settlements; cap. Georgetown.
**Penates** (*pē-nā'tēz*), Rom. gods of the storeroom; each family worshipped its own Penates, which seem to have varied in different families; worship connected with that of Vesta, **3635.**
**Pencil, 2712–4.**
**Penden'nis, Arthur.** The unheroic but human and likable hero of Thackeray's 'History of Pendennis'.
**Penden'tive,** in architecture, **178.**
**Pen'dleton, George Hunt** (1825–89). Amer. political leader, b. Cincinnati, Ohio; Democratic candidate for vice-president, 1864; in House of Representatives 1857–65, in Senate 1879–85; advocate of civil service reform and author of Pendleton Act.
**Pendleton,** Ore. Mfg. city on Umatilla R. 35 mi. s.w. of Walla Walla, Wash.; pop. 7387; in wheat-growing and stock-raising region; has annual cowboy festival, "The Round-Up."
**Pendleton Act, 223.**
**Pend Oreille** (*päń dô-rā'y*), lake in n. Idaho, 35 mi. long, *map,* **1726.**
**Pen'dulum, 2715;** applied to clocks, **797–8,** *picture,* **801;** laws discovered by Galileo, **1391.**
**Penelope** (*pē-nĕl'ō-pē*), in the 'Odyssey', wife of Odysseus; proverbial for patient faithfulness; **2562, 2564–6.**
**Pene'us River** (modern Salamvria), chief r. of Thessaly; 100 mi. long; *map,* **1518;** turned through Augean stables by Hercules, **1640.**
**Penfeld River,** short r. in extreme w. of France; divides Brest, **502.**
**Pen'guin,** an Antarctic sea-bird, **2715–6,** *pictures,* **2864;** care of eggs, **131;** feathers, **1228.**
**Penikese** (*pĕn-i-kēs'*) **Island,** at entrance to Buzzards Bay; 100 acres; Mass. state leper hospital; Agassiz's school, **42.**
**Penin'sula,** in physiography, **2788;** Europe a peninsula of peninsulas, **1188.**
**Peninsular Campaign,** in Amer. Civil War, **778, 2095.**
**Peninsular War** (1808–14), war in which Gt. Brit. assisted Spain and Portugal to free Iberian Peninsula from domination of Napoleon, **3304, 2396, 3717.**
**Penknife,** origin of name, **2710.**
**Penmanship, 1574.**
**Penn, Sir William** (1621–70), Eng. admiral, receives land in America from Charles II, **2716;** home, **510.**
**Penn, William** (1644–1718), founder of Pennsylvania, **2716–7;** acquires Delaware, **989;** house in Philadelphia, *picture,* **2761;** statue in Philadelphia, **2760.**
**Penn College.** At Oskaloosa, Iowa; co-ed.; foundcd 1873 by Friends; arts and science, music, commerce.
**Pennell** (*pĕn'ĕl*), **Joseph** (born 1860), Amer. etcher, lithographer, and author, b. Philadelphia, **1170.**
**Pennine** (*pĕn'in*) **Range,** England, chain of low hills running n. and s. from Tyne R. to Derbyshire, **1150;** coal, **1158.**
**Pennsylvania** (*pĕn-sĭl-vā'nĭ-ȧ*), a middle Atlantic state of U.S.; 45,000 sq. mi.; pop. 8,720,017; cap. Harrisburg; **2717–22,** *maps,* **2718, 3584–5;** agriculture, **2721;** cement, **676;** cities and mfrs., **2718–20, 1591, 2760–2, 2812–3, 2983, 3153;** coal, **2720, 812, 3153;** coke, **824;** commerce, **2720, 2721, 2762, 2812–3;** Delaware R. and Water Gap, **989;** glass, **1474;** iron and steel industry, **2721, 2813, 646;** meaning of name, **3347;** natural gas, **2813, 1407, 1408;** oil production, **2721, 2750, 2754;** physical features, **2717–8, 158;** population, **2717, 2718, 2722, 158, 2813;** state flower, **3347.** —*History,* **2721–2;** colonial period, chief events summarized, **1664–5;** founded, **2716–7;** included Delaware, **989;** early local govt., **3521;** early immigration, **158, 3416;** Ft. Duquesne and Braddock's expedition, **1362;** in Rev. War, **3003, 3615;** Continental Congress and Constitutional Convention, **3593;** public work of Franklin, **1357, 1358;** Connecticut gives up claims to territory, **869;** Whiskey Rebellion, **3678;** invaded in Civil War, **1453–4.**
**Pennsylvania, University of,** at Philadelphia, Pa.; non-sect., co-ed.; established in 1740 as a charitable school; made an academy in 1751 through the efforts of Benjamin Franklin, and became a college 1755; arts and science; engineering, law, medicine, commerce; **2761,** *picture,* **2719;** Wharton School of Finance and Commerce, **3140.**
**Pennsylvania Avenue,** Washington, D.C., **3683,** *picture,* **3680.**
**Pennsylvania College.** At Gettysburg, Pa.; non-sect., co-ed.; founded 1832; arts, science, engineering.
**Pennsylvanian period,** in geologic time, **1418.**
**Pennsylvania Railroad station,** New York City, **2966,** *picturc,* **2496.**
**Pennsylvania State College.** At State College, Pa.; co-ed. state institution; founded 1863; agriculture, engineering, arts and science, mining; home economics.
**Penny.** An Eng. bronze coin worth 1/12 of a shilling or 4 farthings (about 2 cents in U.S. money); before the time of Edward I halfpence and farthings were not coined, but the penny was deeply indented with a cross, so that it could be broken into two or four pieces.
**Pennyroyal,** a mint-like herb or its oil, **2257.**
**Pennyweight,** a unit of measure, **3715;** origin, **3714.**
**Penobscot** (*pē-nŏb'skŏt*), chief r. of Maine, rises in w. near Canadian boundary; flows e., then s. to Penobscot Bay, an inlet of the Atlantic, **2126.**
**Penobscot Indians,** New England tribe of Algonquian group, **2125.**
**Pensaco'la,** Fla., port on Pensacola Bay, 6 mi. from Gulf of Mexico; pop. 31,035; fish, lumber, and shipbuilding interests; large naval air station; figured in War of 1812 and Civil War; **1295, 1300;** shipyard, *picture,* **3215.**
**Pensions, 2722;** defined by Dr. Johnson, **1898;** granted to literary men in England, **2848, 1899;** industrial, **646, 1178, 1449;** old-age, **2722, 2039, 267, 2500.**
**Pensions, Bureau of,** U.S., **2722, 3600.**
**Pentateuch** (*pĕn'tȧ-tūk*), first five books of Bible, **2333.**
**Pentathlon** (*pĕn-tăth'lŏn*), fivefold match in Gk. Olympic Games, **2580.**
**Pen'tecost.** Same as **Whitsunday.**
**Pentel'icus, Mt.** (modern Mendeli), near Athens, **249, 1529.**
**Penthesilea** (*pĕn-thĕs-i-lē'ȧ*). Daughter of Ares and queen of the Amazons; aided Trojans against Greeks; slain by Achilles.
**Pent'land Firth,** channel separating Orkney Isls. from mainland of Scotland, and connecting Atlantic Ocean with North Sea; *map,* **1152–3.**
**Pent'landite,** an ore of nickel, **2507.**
**Penum'bra,** of eclipse, *diagram,* **1074,** *picture,* **1075.**
**Penzance'.** A small port in Cornwall; the westernmost town in England.
**Pe'onage,** in Mexico, **3249–50;** in S. Amer., **3288, 738, 1079.**
**Pe'ony,** plant of the crowfoot family, **2722–3.**
**Peo'ria,** Ill., mfg. and r.r. city in n.-center on Illinois R.; pop. 76,121; formerly great distilling center; agricultural implements, paper, automobiles; **1734;** Ft. Crevecoeur, **1964.**
**Pep'in** or **Pippin the Short** (d. 768), first Carolingian king of the Franks, son of Charles Martel and father of Charlemagne, **688, 697, 2979.**
**Pepin II** (sometimes called Pepin of Heristal) (d. 714). Duke of the Franks; as leader of nobles of Austrasia gaincd great victory over Neustria which made him master of almost entire Gaul; subdued Frisians and Alamanni; father of Charles Martel.
**Pepin, Lake,** Minn., **2266,** *picture,* **2253.**
**Pep'los,** Gk. garmcnt, **897,** *picture,* **898.**
**Pepper, 2723–4, 3317, 3318,** *picturcs,* **3319.**
**Peppermint, 2257,** *picture,* **1226.**
**Pep'sin,** protein-digesting ferment in gastric juice, **2724, 1010–1;** cnzyme propertics, **1173.**
**Pep'tone,** product of pepsin action upon a proteid, **1010–1, 2724.**
**Pepys** (*pēp'is, pēps,* or *pĕps*). **Samuel** (1633–1703), Eng. diarist and public official; diary, **1165;** home in London, **2052;** and Radisson, **2052.**
**Pequon'nock,** early settlement on site of Bridgeport, Conn., **510.**
**Pequonnock River,** Conn., **510.**
**Pequot** (*pē'kwŏt*) **Valley,** Conn., **866.**
**Pequot War, 1637–8, 1772, 868;** monument, *picture,* **867.**
**Pera** (*pā'rä* ), part of Constantinople, **871.**
**Perak** (*pā-räk'*), a Malay state bordering Siam on s.; 7800 sq. mi.; pop. 500,000; **2130.**
**Percentage and interest, 2724–6.**
**Percep'tion,** in psychology, **2930.**
**Per'ceval** or **Percival, Sir,** knight of Round Table, **3068, 1391.** *See also in Index* **Parsifal.**
**Perch,** a gamy fresh-water fish, **2726, 1278;** skeleton, *picture,* **3245.**
**Perch,** a unit of mcasure, **3715;** origin, **3714.**
**Perch, climbing, 1277.**
**Perch, Tasmanian,** *picture,* **1271.**
**Percheron** (*pĕr'shĕ-rŏn*), a heavy type of horse, **1685,** *picturc,* **49.**
**Percus'sion cap, 1254.**
**Percussion instruments, 2381, 2383;** *pictures,* **2382;** in orchestra, **2591.**
**Percy,** English family, **1634.**
**Percy Sir Henry** (1364–1403). "Harry Hotspur," Eng. warden of Scotch marches and hero of Chevy Chase (1388); killed in rebellion against Henry IV; **1634.**
**Percy, Bishop Thomas** (1729–1811), ballad collection, **1166.**
**Perdica'ris, Ion, 2327.**
**Perdido** (*pĕr-dē'dō*) **River,** short stream flowing into Gulf of Mexico, **72.**
**Perdita** (*pĕr'dĭ-tȧ*), in Shakespeare's 'Winter's Tale', **3756.**
**Pereda** (*pā-rā'thȧ*), **José Mariade** (1833–1906), Span. novelist, **3308.**
**'Père Goriot'** (*pêr gō-ryō'*). Novel by Balzac, in which an indulgent father is made victim of his daughter's social ambition and folly.

**Peregrine** (*pĕr'ĕ-grĭn*), a falcon, **1606.**
**Perekop** (*pā-rā-kôp'*), **Isthmus of, 922.**
**Père Lachaise** (*lä-shāz'*). Famous cemetery in n.e. Paris; contains 20,000 monuments and 800,000 graves, including many of great figures in Fr. history.
**Peren'nial plants, 2830;** familiar weeds, **3712.**
**Pérez Galdós** (*pā'rāth gȧl-dōs'*), **Benito** (1845–1920), Span. novelist and dramatist ('Doña Perfecta'), **3308.**
**Perfumes, 2726–9;** animal, **2728, 923, 979;** eau de Cologne, **834;** essential oils, **1225;** synthetic, **2729;** vegetable, **2728–9, 3619, 3171.**
**Pergamum** (*pĕr'gȧ-mŭm*) or **Pergamus,** celebrated anc. city of n.w. Asia Minor, cap. of kingdom of Pergamus and later of Rom. province of Asia; fine sculptures; parchment, **2667.**
**Perian'der** (d. about 585 B.C.), Gk. sage, **3275.**
**Per'ianth,** petal and sepal structure of a flower, **3939.**
**Pericar'dium.** A cone-shaped membranous sac which encloses the heart and about two inches of the great blood vessels attached at its base to the diaphragm; the inner surface, a serous membrane, secretes a thin fluid which lubricates the heart.
**Per'icarp,** pulpy seed-envelope of fruits such as apples, **1380.**
**Pericles** (*pĕr'ĭ-klēz*) (493?–429 B.C.), Athenian statesman, **2729–30;** beautifies Athens, **11, 2760;** in 2d Peloponnesian War, **1524.**
**Pericles, Age of, 1522.**
**'Pericles and Aspasia'.** Book by Walter Savage Landor, comprising imaginary letters, speeches, poems; "a kind of concentrated extract of the Periclean Age."
**Per'igon,** in geometry, **1423.**
**Perigynous** (*pĕ-rĭj'ĭ-nŭs*) **flowers, 3939.**
**Per'ilymph,** fluid filling bony labyrinth of ear, **1057.**
**Perim** (*pā-rēm'*). Small Brit. isl. at s. end of Red Sea; coaling and supply station.
**Period,** mark of punctuation, **2936.**
**Period,** in mechanics, the time taken by a recurring event; in geology, **1418;** in radio circuits, **3762.**
**Period'icals, 2472–5.**
**Periodic law,** in chemistry, **4041.**
**Perioeci** (*pĕr-ĭ-ē'sī*), free laborers of Sparta, **3309.**
**Peripatet'ic philosophy, 196.**
**Perique** (*pĕ-rēk'*) **tobacco, 2070, 3509.**
**Per'iscope, 2730, 3376,** *pictures,* **3377.**
**Peristal'tic motion, 1011.**
**Peritone'um.** A serous membrane which encloses all the organs lying in the abdominal and pelvic cavities; inflammation of the peritoneum is called peritonitis.
**Per'iwinkle,** a sea-snail with top-shaped shell, **3256, 2281.**
**Periwinkle,** various plants of dogbane family with opposed evergreen leaves; trailing myrtle, **2385.**
**Perkin, Sir William Henry** (1838–1907), Eng. chemist; discoverer of the first aniline color, aniline purple, and founder of the coal-tar color industry; **1050, 1263.**
**Perley, Sir George Halsey** (born 1857). Canadian High Commissioner at London after 1917; member Dominion House of Commons 1904–17, and various cabinet positions 1911–17.
**Perlis,** a native Malay state; 316 sq. mi.; pop. 35,000; **2130.**
**Perm** (*pĕrm*). Cap. of Perm govt. in e. Russia on Kama R.; pop. 105,000; iron, copper smelting, machinery mfr.; river trade.
**Permanganate** (*pĕr-măn'gȧ-nāt*), any salt of permanganic acid $HMnO_4$); of potassium, **485;** of sodium, **2135.**
**Per'mian period,** in geology, **1418,** *picture,* **1419.**
**Pernambuco** (*pĕr-năm-bų'kō*) or **Recife** (*rā-kē'fā*), Brazil, seaport, mfg. center, and cap. of state of Pernambuco on Atlantic coast at easternmost point of S. Amer.; pop. 250,000; commerce, **495.**
**Peronne** (*pā-rōn'*), France, fortified town on Somme R., 94 mi. n.e. of Paris; Charles the Simple and Louis XI imprisoned here; unsuccessfully besieged by Imperialists (1536); taken by Germans 1871; in World War, **3794, 3275.**
**Perox'ide of hydrogen** ($H_2O_2$), a mild antiseptic, **151;** bleaching properties, **435.**
**Perpendic'ular,** in geometry, **1424.**
**Perpendicular style,** in architecture, **187;** Canterbury Cathedral, *picture,* **637.**
**Perpet'ual calendar, 574.**
**Perpetual** or **Everlasting League,** Swiss, **3415, 3464.**
**"Perpetual motion" machines, 1148.**
**Perpignan** (*pĕr-pē-nyäN'*), France. Fortified city in s. on Têt R., 7 mi. from Mediterranean; pop. 40,000; 14th cent. cathedral; commands passage by e. Pyrenees from Spain into France.
**Perrault** (*pĕ-rō'*), **Charles** (1628–1703), Fr. author who gave literary form to many old fairy tales, **2340.**
**Perry, Matthew Calbraith** (1794–1858), Amer. commodore, brother of O. H. Perry; expedition to Japan, **1862, 1240.**
**Perry, Oliver Hazard** (1785–1819), Amer. naval officer, **2730, 3672,** *picture,* **3671.**
**Perryville,** Ky. Town 40 mi. s. of Frankfort; here Federals under Gen. Buell defeated Confederates under Gen. Bragg, Oct. 8, 1862.
**Perseids** (*pĕr'sē-ĭdz*), **2204.**
**Persephone** (*pĕr-sĕf'ō-nē*) or **Proserpina,** in Gk. and Rom. myth., daughter of Demeter (Ceres), **991–3, 2875;** origin of mint plant, **2257.**
**Persepolis** (*pĕr-sĕp'ō-lĭs*), anc. cap. of Persian Empire, in s.w. 35 mi. n.e. of modern city of Shiraz; **2734;** tomb of Cyrus, **2737.**
**Perseus** (*pĕr'sūs*), in Gk. myth., hero who slew Medusa, **2731–2;** statue by Canova, *picture,* **3159.**
**Perseus,** a northern constellation, *charts,* **873, 3343.**
**Pershing, John Joseph** (born 1860), Amer. general, **2732–3;** in Mexico, **2217;** in Philippines, **2766;** in World War, **3803, 3805, 3110.**
**Persia** (*pĕr'shȧ*), a mountainous country of s.w. Asia; 628,000 sq. mi.; pop. between 8,000,000 and 10,000,000; cap. Teheran; **2733–8,** *map,* **232–3;** anc. architecture, **176;** cuneiform writing, **939;** chief cities, **2733, 2734–5;** Kurds, **1945;** language, **224, 2771;** physical features, **2733–4, 228,** *map,* **232–3;** population, **2733, 2735,** *map,* **232–3;** rainfall, **2735,** *map,* **232–3;** religion, **2278, 2736, 3841–2;** rug-making, **3077, 3078;** turquoises, **1410, 2734;** vegetation, *map,* **232–3.** —*History,* **2737–8,** chief events summarized, **1656;** Median supremacy, **2191;** Cyrus the Great, **2737, 923;** wars against Greece, **2738–40;** Alexander conquers, **2738, 86, 87;** Assassin sect, **236;** Mongol conquest, **2285.**
**Persian cat, 658,** *pictures,* **659.**
**Persian Gulf,** arm of Indian Ocean separating Persia from Arabia, **2738, 228.**
**Persian lamb,** fur, **1390, 1389, 237.**
**Persian rugs, 3077, 3078.**
**Persian Smoke,** cat, *pictures,* **658, 659.**
**Persian walnut, 2545.**
**Persian Wars** (493–479 B.C.), **2738–40, 1522;** effect on Greek art, **1529;** Marathon, **2739, 2143–4;** Phoenician navy, **2774;** Salamis, **2740, 3113, 195;** Thermopylae, **2740, 3487.**
**Persian wheel,** a primitive type of pump, **2934,** *picture,* **3696.**
**Persia pitch, 3436.**
**Persim'mon,** a tree of the ebony family, **2740;** classified, **3533.**
**Person,** in grammar, **3627.**
**Personal names, 2388–9;** superstitions about, **2118.**
**Personifica'tion,** figure of speech, **1238.**
**Perspec'tive, 2740, 2628–9.**
**Perspira'tion, 3246, 1207.**
**Perth** (*pĕrth*), cap. of Western Australia in s.w. on Swan R. 12 mi. above port of Fremantle; pop. with Fremantle 142,000; univ.; railway, **264.**
**Perth,** Scotland. Cap. of Perthshire on Tay R. 32 mi. n.w. of Edinburgh; pop. 36,000; rope and twine, textiles, dyes; stock market; scene of murder of James I (1437).
**Perth Amboy,** N.J. Industrial city and port 20 mi. s. of New York, with large shipping interests, especially of coal; pop. 41,707; terracotta, iron, copper, lead products; oil refineries and shipyards.
**Peru** (*pĕ-rų'*), republic on Pacific coast of S. Amer.; 722,000 sq. mi.; pop. 4,500,000; **2741–5,** *maps,* **2744, 3288–9;** Andes Mts., **122–3;** cap. Lima, **2009;** climate, **2741, 2973,** *map,* **3288–9;** minerals, **2742, 2744, 3242, 3289;** mummies, **2369, 904;** population, **2744,** *picture,* **3287,** *map,* **3288–9;** quinine, **2950, 2742;** surface features, **2741–2,** *map,* **3288–9;** transportation, **2742, 2744;** vegetation, *map,* **3288–9.** —*History,* **2744–5, 3289;** Pizzaro's conquest, **2814;** Incas, **1741;** independence gained, **2744, 447–8;** war with Chile, **2744, 738.**
**Peru,** Ind. Commercial center for agricultural region, about 70 mi. n. of Indianapolis on Wabash R.; pop. 12,410; various mfrs.
**Perugia** (*pā-rų'jȧ*), Italy, historic city on Tiber R. 84 mi. n. of Rome; pop. 70,000; cathedral and other interesting buildings; Etruscan gateways, frescoes by Perugino; old univ. (13th cent.); anc. Perusia was one of 12 principal cities of Etruria; taken by Romans 310 B.C.; center of Umbrian school of painting (15th cent.), **2629.**
**Perugino** (*pā-rų-jē'nō*), "easel name" of Pietro Vannucci (*vän-nų't'chē*) (1446–1524), of Perugia; created classic type of Madonna and molded early style of Raphael; **2629, 2976.**
**Peru'vian balsam, 3118.**
**Peruvian bark.** Same as **Quinine.**
**Peruvian cotton, 904, 906.**
**Pesaro** (*pā'zä-rō*), Italy. Seaport on Adriatic at mouth of Foglia R.; pop. 29,000; several palaces; silk, ships, ironware, earthenware; founded by Romans as *Pisaurum* 184 B.C.
**Pescadores** (*pĕs-kȧ-dō'rēz*) ("fishers' islands"). An isl. group (50 sq. mi.) between China and Formosa; belongs to Japan. Name also given to a small group off coast of Peru.
**Peseta** (*pā-sā'tȧ*). A silver coin, the unit of the Span. monetary system; worth 19.3 cents of U.S. money.
**Peshawar** (*pĕ-shä'wär*) or **Peshawur,** cap. of Northwest Frontier Province, Brit. India, on Bara R. 19 mi. e. of Khyber Pass; pop. 98,000; center of trade with Afghanistan and Bokhara; manufactures scarfs; **1744;** railway, **31.**
**Peshkof, Alexis.** *See in Index* **Gorky, Maxim.**
**Pes'simism, 1221, 2586.**
**Pest,** Hungary, old town, now part of Budapest, **524.**
**Pestalozzi** (*pĕs-tä-lŏt'sē*), **Johann Heinrich** (1746–1827), Swiss educational reformer, chief founder of modern pedagogy, **1372, 3655.**

**Pétain** (*pā-tăñ'*), **Henri Philippe** (born 1856), marshal of France; in World War, commander of Fr. army at Verdun during Ger. drive (Feb.–March 1916), commander-in-chief of Fr. armies on w. front from May 1917; at Verdun, **3629, 3794;** triumphal entry into Metz, **103.**
**Petals,** of flowers, **1304–7, 1981, 3939.**
**Peter I, the Great** (1672–1725), czar of Russia, **2745–7, 3090, 3097;** Bering's explorations, **384;** conquers Baltic provinces, **1180, 1969;** founds Petrograd, **2747;** war with Charles XII, **698.**
**Peter III** (1728–62), emperor of Russia, imbecile grandson of Peter the Great; deposed July 1762 after 6 months' rule by his wife, Catherine II, and probably murdered; makes peace with Prussia, **3180.**
**Peter I, Kara-Georgevitch** (1846–1921), king of Serbia, **3177, 3795.**
**Peter.** *See also in Index* **Pedro.**
**Peter, Saint,** one of the Twelve Apostles, **2745, 157, 2665.**
**Peter Lombard** (1100?–60), Ital. theologian and teacher; made bishop of Paris 1159 ('Four Books of Sentences', famous theological textbook); **2773.**
**Peter the Hermit** (d. 1115), Fr. monk, "revivalist" preacher of First Crusade, **929.**
**Peter, Epistles of,** two books of New Testament ascribed to Apostle Peter; addressed to scattered Christians urging them to conduct themselves in an exemplary manner and avoid false teachings; **2745.**
**Peterborough** (*pē'tēr-bŏr-ō*), England. City 76 mi. n. of London on Nene R.; pop. 34,000; famous old cathedral (begun 12th cent.); agricultural implements, locomotives.
**Peterborough,** Ontario, mfg. city and farming and dairying center 70 mi. n.e. of Toronto; pop. 24,000; immense electrical power; machinery, dairy supplies, farm implements, cereals, shoes, clocks, lumber products, textiles; hydraulic lift in Trent Canal, *picture,* **2583.**
**'Peter Pan',** fairy play by Sir James M. Barrie, **333;** story retold, **334–7;** compared with 'The Blue Bird', **2111;** Maude Adams in, *picture,* **1036.**
**Petersburg,** Va., industrial city on Appomattox R. 22 mi. s. of Richmond; pop. 31,012; trade in tobacco, lumber, and peanuts; various mfrs.; famous for 10 months' siege in Grant's campaign against Richmond; **1498.**
**Petiole** (*pĕt'ĭ-ōl*), of leaves, **1982.**
**Petitgrain oil, 2677.**
**Petit** (*pĕt'ĭ*) or **petty jury, 1903;** developed by Henry II, **1633–4.**
**Petit Rhone** (*pĕ-tē' rōn*), branch of Rhone, **3012.**
**Petos'key,** Mich., resort on Little Traverse Bay, 60 mi. n.e. of Traverse City; pop. 5064; passenger pigeons slaughtered, **2803.**
**Petra** (*pē'trä*). Anc. city in mts. of n.w. Arabia; once important caravan center; cap. of Nabataeans; absorbed into Rom. empire 106 A.D.; many remarkable remains, especially temples and dwellings hewn out of cliffs.
**Petrarch** (*pē'trärk*) **(Francesco Petrarca)** (1304–74), Ital. lyric poet, scholar, and patriot, second to Dante alone in Ital. poetry, **2995–6, 1833, 1294,** *picture,* **1832;** influence on Chaucer, **702.**
**Pet'rel,** a sea bird, **2747;** care of young, **408.**
**Petrie** (*pē'trĭ*), **William Matthew Flinders** (born 1853). Eng. Egyptologist; author of many works on Egyptian history and antiquities.
**Petrified Forest,** Arizona, **200, 2400.**
**Pet'rograd** (formerly St. Petersburg), cap. of Rus. empire from 1703 to 1917, **2747–9,** *pictures,* **2748, 3090, 3092, 3093;** founded by Peter the Great, **2747;** New Year's custom, **2479.**
**Petrol',** another name for gasoline, **1408.**
**Petrola'tum,** a product of petroleum, **2754.**
**Petro'leum, 2749–55;** in Africa, **41;** Burma, **541;** Canada, **82, 512, 610, 2102;** chief fields of world, **2754–5,** *map.* **2752;** conservation, **869;** deepest well, *picture,* **51;** E. Indies, **1072;** factor in U.S. development, **3584;** fractional distillation, **2753–4, 1014;** gasoline production, **2754, 1408, 1014;** geologic age, **1418, 2750–2;** illuminating gas from, **1407;** Japan, **1868;** Mesopotamia, **2201;** Mexico, **2211–2,** *picture,* **2214;** natural gas associated, **1408;** N. Amer., **2516, 2755;** origin and nature, **2750, 1225;** paraffin from, **2676;** Persia, **2736;** pipe lines, **2754,** *picture,* **2753;** Rumania, **3081;** Siberia, **305;** S. Amer., **2755, 2742, 1079;** Standard Oil Co., **3034;** as steamship fuel, **3214.** —*U.S. fields,* **3590, 2754;** Alaska, **74;** Calif., **578;** Ind., **1760;** Kan., **1911;** La., **2070,** *picture,* **2069;** Okla., **2576;** Pa., **2720;** Tex., **3473;** W. Va., **3723;** Wyo., **3820.**
**Petroleum V. Nasby.** *See in Index* **Nasby.**
**Petro'nius Arbiter,** Rom. writer of age of Nero, **1967.**
**Petruchio** (*pē-trŏŏ'chĭ-ō*). Hero of Shakespeare's 'Taming of the Shrew', who tames Katherine, "the shrew," into a model wife.
**Pets and their care, 2755–8;** a Chinaman and his birds, *picture,* **742;** getting rid of fleas, **1292.** *See also in Index* **Canary; Cat; Dog;** etc.
**Petty jury.** Same as **Petit jury.**
**Petty officer,** in U.S. Navy; uniform and insignia, **3578,** *picture,* **3577.**
**Petu'nia,** a flowering plant, **2758–9.**
**Petun'tse,** Chinese name for variety of feldspar, **2883.**
**Pe'wee,** name of various flycatcher birds, **1313–4;** camouflaged nest, **406.**
**Pew'ter,** an alloy, **99.**
**Pfalz** (*pfälts*). Ger. name for **Palatinate.**
**Pforzheim** (*pfōrts'hīm*), Germany, mfg. town in Baden, 16 mi. s.e. of Karlsruhe; pop. 74,000; **303.**
**Phaeacians** (*fē-ā'shănz*), in Gk. myth., people who inhabited isl. of Scheria (probably Corfu); entertain Odysseus, **2563–4.**
**Phaethon** (*fā'ĕ-thŏn*), in Gk. myth., **2759.**
**Phagocytes** (*făg'ō-sīts*), body cells that destroy bacteria and other cells; white blood cells (leucocytes), **437,** *picture,* **1451.**
**Phalangers,** various five-toed marsupials, **1908,** *picture,* **266.**
**Phalanges** (*fă-lăn'ĝēz*) (plural of phalanx), scientific name for toes or fingers, **1571, 1322.**
**Phalanx** (*fā'lănks*), order of ranks in battle; Assyrian, *picture,* **297;** finger bones named from, **1571;** Macedonian, **86;** of Sparta and Thebes, **3486,** *picture,* **3485.**
**Phalarope** (*făl'ä-rōp*), a sandpiper-like bird; males hatch the eggs, **411.**
**Phalerum** (*fă-lē'rŭm*). One of anc. harbors of Athens, chiefly used before Persian Wars; superseded by port of Piraeus.
**Phan'erogams.** In the Linnaean classification, all flowering plants.
**Pharaohs** (*fā'rōz*), kings of anc. Egypt, **1099.**
**Pharaoh's rat,** an ichneumon, **1724.**
**Phar'isees,** most powerful and exclusive Jewish sect at time of Christ; especially exact in observance of traditions and ceremonies; **1891;** denounced by Jesus, **1888.**
**Pharmacopeia** (*fär-mä-kō-pē'yà*), U.S., **1042.**
**Pharmacy** (*fär'mà-sĭ*), foundations laid by Arabs, **2278;** drugs, **1041–2.**
**Pharos** (*fā'rŏs*), isl. at mouth of the Nile, **88.**
**Pharos,** famous lighthouse, one of Seven Wonders of World, **3178, 2004,** *picture,* **3179.**
**Pharpar** (*fär'pär*) **River.** One of the two famous "rivers of Damascus." *See in Index* **Abana.**
**Pharsalus** (*fär-sā'lŭs*) (now Pharsala), Gk. city of s. Thessaly; battle between Caesar and Pompey (48 B.C.), **564, 2878.**
**Pharynx** (*făr'ĭnks*). Lined passage running from nostrils above and behind the mouth to the esophagus.
**Phases of moon, 2318.**
**Pheasant** (*fĕz'ănt*), a long-tailed fowl-like bird, **2759;** eared pheasant, *picture,* **410;** ruffed grouse miscalled a pheasant, **1544.**
**Pheasant family,** or *Phasianidae,* bird family of the fowl order; altitude range, *picture,* **397;** includes chickens, **2908–11,** peacocks, **2699–2700,** pheasants, **2759,** turkeys, **3556.**
**Pheidippides** (*fī-dĭp'ĭ-dēz*), Athenian runner, **2144.**
**Phelps** (*fĕlps*), **Elizabeth Stuart** (1844–1911) (Mrs. Herbert D. Ward). Amer. author, b. Andover, Mass. ('Gates Ajar', story dealing with problem of life after death).
**Phelps, William Lyon** (born 1865). Amer. literary critic, b. New Haven, Conn.; professor of English at Yale Univ. ('Essays on Russian Novelists'; 'The Advance of the English Novel'; 'Essays on Modern Dramatists').
**Phenacetin** (*fĕ-năs'ĕ-tĭn*), a fever-allaying drug; obtained from coal-tar, **1042.**
**Phe'nol.** Same as **Carbolic acid.**
**Phenolphthalein** (*fē-nŏl-thăl'ē-ĭn*), a laxative drug obtained from coal-tar, **1042.**
**Phi Beta Kappa** (*fī bē'tà kăp'à*), honorary fraternity, **828.**
**Phidias** (*fĭd'ĭ-ăs*) (500?–430? B.C.), greatest Gk. sculptor, **2759–60, 1530, 11–12;** statue of Zeus, **3178,** *picture,* **3179.**
**Philadelphia** (*fĭl-à-dĕl'fĭ-à*), Pa., chief city of state and 3d city of U.S.; pop. 1,823,779; **2760–2;** carpet production, **3080;** history, **2717, 3003, 3593;** Hog Island, **3214, 3216,** *picture,* **3210;** Liberty Bell, **976;** Port Richmond water front, *picture,* **2721;** sugar refining, **3386;** U. of Pennsylvania, College Hall, *picture,* **2719;** U.S. Mint, **2258–9.**
**'Philadelphia',** U.S. frigate, **971.**
**Philae** (*fī'lē*), **Temple of,** on isl. of Philae in Nile R.; erected by Egyptians to goddess Isis, 4th cent. B.C.; **1107,** *picture,* **1106.**
**Philately** (*fī-lăt'ĕ-lĭ*), stamp-collecting, **3337.**
**Phile'mon, Epistle to.** Book of New Testament; written by Paul during first captivity at Rome explaining the return of a runaway slave who had been converted to Christianity.
**Philip,** one of the Twelve Apostles, **157.**
**Philip I** (1052–1108), king of France; seized advantage of quarrels among his powerful vassals to enlarge crown holdings; ancestry, **2762.**
**Philip II, Augustus** (1165–1223), king of France, **2762, 1634;** quarrels with Richard I, **3015, 3016;** wins Normandy from England, **2513.**
**Philip IV, the Fair** (1268–1314), king of France, **2762–3, 454;** calls first Estates-General, **1178;** suppresses Knights Templars, **932.**
**Philip VI** (1293–1350), king of France. **2763, 1699.**
**Philip II** (382–336 B.C.), king of Macedon, father of Alexander the Great, and conqueror of Greece, **85, 86, 1525;** Demosthenes denounces, **993.**

**Philip I** (1478–1506). King of Spain; son of Maximilian I and Mary of Burgundy; right to Castile and Aragon through wife Joanna disputed by his father-in-law Ferdinand; father of Charles V.
**Philip II** (1527–98), king of Spain, **2763, 3304;** Armada defeated, **210–1;** intrigues in France, **2763, 1637;** battle of Lepanto, **682, 3559;** makes Madrid royal capital, **2110;** marries Mary of England, **2157;** revolt of Netherlands, **3741, 2442;** seizes Portuguese crown, **2890.**
**Philip IV** (1605–65), king of Spain, incapable administrator; reign marked by rapid decline of Spanish power; honors Velasquez, **3619.**
**Philip V** (1638–1746), king of Spain, grandson of Louis XIV, founder of Bourbon dynasty, **2763, 2066.**
**Philip, King,** the Indian chief Metacomet (1639?–76), sachem of Wampanoags in Mass.; son of Massasoit; leader of "King Philip's War" (1676) against New England colonists, **1772.**
**Philip, "the Good"** (1396–1467), duke of Burgundy; signed treaty of Troyes for France; later aided English against France, gaining considerable territory; patron of commerce and industry; founds order of Golden Fleece, **518.**
**Philip of Swabia** (1177?–1208), youngest son of Frederick Barbarossa, duke of Swabia; succeeded brother Henry VI as emperor 1198; murdered while disputing claims of his rival, Otto IV; **2606.**
**Philippe Egalité.** *See in Index* **Orleans, Louis Philippe, Duke of.**
**Philippi** (*fĭ-lĭp'ī*), anc. city of n.e. Macedonia; battle of (42 B.C.), **258.**
**Philip'pians, Epistle to.** Book of the New Testament; letter from Paul to Christians at Philippi reassuring them of his prospects of release and appealing for unity in their church; probably written at Rome shortly before his release 63 A.D.
**Philip'pics,** of Demosthenes, **993;** of Cicero, **765.**
**Philippine** (*fĭl'ĭ-pĭn*) **Islands,** archipelago between China Sea and Pacific Ocean; 115,026 sq. mi.; pop. 10,350,000; **2764–70, 1070, 1072,** *maps,* **232–3, 2624–5, 2768;** bananas, **324;** cable connections, **561;** cap. Manila, **2136;** climate, **2765;** coconuts and copra, **818–20, 2769;** education, **2767–8;** elevation, *map,* **232–3;** forests and forest products, **2769, 2125, 3074;** government, **2770, 3599;** Manila hemp, **2768–9, 1630,** *pictures,* **3064;** population, **2764, 2765–7,** *map,* **232–3;** rainfall, **2765,** *map,* **232–3;** rice, **3015;** sugar, **3385;** vegetation, *map,* **232–3;** water buffalo, **527.** —*History,* **2770;** Magellan discovers, **2116;** in Span.-Amer. War, **1000–1,3307;** rebellion against U.S. rule, **2104;** administration of Taft, **3428;** Pershing's work, **2733.**
**Philippine mahogany, 2125.**
**Philippopolis** (*fĭl-ĭ-pŏp'ō-lĭs*). The 2d city of Bulgaria, 80 mi. s.e. of Sofia; pop. 48,000; anc. Thracian city; huge trade in silk, cotton, attar of roses, grains, and hides.
**Philipsburg,** N.J. City on Delaware R. 50 mi. n. of Trenton; pop. 16,923; r.r. shops, iron and steel mfrs.; silk mills.
**Philis'tines,** tribe of anc. Canaan, **2770, 3425;** David defeats, **967.**
**Phil'lips, David Graham** (1867–1911). Amer. novelist, b. Madison, Ind. ('The Great God Success'; 'The Fortune Hunter').
**Phillips, Stephen** (1868–1915), Eng. poet ('Marpessa'; 'Paolo and Francesca'), **1167.**
**Phillips, Wendell** (1811–84), Amer. abolitionist orator, b. Boston, placed abolition above union; introduced direct colloquial style of Amer. oratory; in abolitionist movement, **1401;** and women's rights, **3778.**
**Phillips Exeter Academy,** boys' school at Exeter, N.H.; founded 1782; **2456.**
**Phillpotts** (*fĭl'pŏts*), **Eden** (born 1862), Eng. novelist ('Children of the Mist'; 'Widdicombe Fair'; 'Orphan Dinah'; 'Miser's Money'), **2541.**
**Philology** (*fĭ-lŏl'ō-ġĭ*), **2770–2;** English language, **1161–2;** helps in study of early man, **2771, 3524;** personal names, **2388–9;** universal language, **1177.**
**Philomel** (*fĭl'ō-mĕl*) or **Philome'la.** Poetic name for nightingale. Philomela, in Gk. myth., was sister of Procne, wife of Tereus, king of Thrace; in revenge for their wrongs they killed Itys, Tereus' son, and served him as food to his father; the gods punished them by turning Procne into a swallow and Philomela to a nightingale.
**Philosophy** (*fĭ-lŏs'ō-fĭ*), **2772–3;** work of Aristotle, **196;** Epictetus, **1173;** ethics, **1180;** in Germany, **1436, 1438;** Greek, **1537–8;** Marcus Aurelius, **2146–7;** Plato, **2832;** Pythagoras, **2941–2;** Socrates, **3270, 1538.**
**Phineus** (*fĭ-nūs'*), in Gk. myth., Thracian king; tormented by Harpies, **1591.**
**Phiva** or **Thivai,** Greece, modern name for Thebes; pop. 3500; **3486.**
**Phlogiston** (*flō-ġĭs'tŏn*), theoretical "fire substance" supposed in 17th and 18th cents. to exist in combustible bodies and be lost upon combustion; theory overthrown by Lavoisier, **1249.**
**Phlox** (*flŏks*), a garden flower, **2773;** pollen grain, *picture,* **1309.**
**Phobos** (*fō'bŏs*), satellite of Mars, **2819.**
**Phocion** (*fō'shĭ-ŏn*) (d. 317 B.C.). Athenian general, opponent of Demosthenes and the anti-Macedonians, virtual ruler of Athens for a time after Chaeronaea; finally forced to drink hemlock for alleged treason.
**Phocis** (*fō'sĭs*), anc. dist. in cent. Greece; chief mt., Parnassus; took part in Sacred War (357–346 B.C.) and was conquered by Philip of Macedon; contained Delphic oracle, **991;** *map,* **1518.**
**Phoebe** (*fē'bē*), a bird of the flycatcher family, **1313, 1314, 422,** *picture,* **1314;** nests, **406.**
**Phoenicians** (*fē-nĭsh'ĭ-ănz*), Semitic race inhabiting narrow strip along Mediterranean coast of anc. Syria, **2773–4,** *map,* **298;** alphabet, **100, 101, 2774;** colonies, **3549, 650, 947, 2131, 2194, 3230, 3302;** glass-making, **1471;** bring grape to Europe, **1502;** language, **1624;** ships, **3207;** aid Solomon, **2774, 3274.**—*Exploration and commerce,* **2773, 2774, 1416;** Africa, **36;** Britain, **1151, 3504;** Egypt, **1102;** Spain, **3303.**
**Phoenix** (*fē'nĭks*), Ariz., cap. and popular winter and health resort in s.-center; pop. 29,053; trade center of rich farming dist. created by great Roosevelt Dam; mining interests; Salt River project, **1829.**
**Phoenix.** Fabulous sacred bird of anc. Egyptians, said to come out of Arabia every 500 years to Heliopolis, where it burned itself on altar and rose again from its ashes young and beautiful; symbol of rising sun and of immortality.
**Phoenix Park,** Dublin, **1043, 2690.**
**Phoenixville,** Pa. Iron and steel mfg. borough on Schuylkill R. 23 mi. n.w. of Philadelphia; textiles, matches; pop. 10,484.
**Pholio'ta,** a mushroom, *picture* facing **2374.**
**Pho'nograph, 2774–6;** dictaphone, **1010;** records made of "condensite," **816.**
**Phonog'raphy,** a form of shorthand, **3224–5.**
**Phonop'ticon, 2003.**
**Phorcys** (*fôr'sĭs*). In Gk. myth., a sea-god, father of the Gorgons, the Graeae, and other monsters.
**Phosgene** (*fŏs'ġēn*), a poison gas, **1408.**
**Phosphate** (*fŏs'fāt*), a salt of phosphoric acid; in baking powders, **305;** calcium, **571;** as fertilizer, **1235;** in human body, **2792, 452;** magnesium, **452,** mining, *picture,* **1300.**
**Phosphate rock, 2777, 1235;** in Fla., **1296;** Idaho, **1727;** Pacific isls., **2623;** S.C., **3291, 3292;** Tenn., **3468.**
**Phos'phor bronze, 515.**
**Phosphorescence** (*fŏs-fŏr-ĕs'ĕns*), emission of light without heat, **2776;** of deep sea animals, **2556,** *picture,* **2557;** among insects, **1262, 1263** produced by bacteria, **303;** radium excites, **2960.**
**Phosphor'ic acid,** a compound of hydrogen, oxygen, and phosphorus; as fertilizer, **1235.**
**Phos'phorus,** a soft yellowish element that burns at low temperatures, **2776–7;** antidotes, **2776, 2855;** alloyed with bronze, **515;** in bones, **452;** in protoplasm, **394,** in iron and steel, **1826;** made in electric furnace, **1383;** in matches, **2170;** needed by plants, **1235, 2824,** *picture,* **2821.**
**"Phossy jaw," 2777.**
**Photog'raphy, 2777–84;** in astronomy, **2552;** cameras, **2778–80, 2782–3, 591;** developing and printing, **2781–2;** educational value, **2777–8;** "hunting" with camera, **2414,** *pictures,* **2406, 2407, 2410, 2411;** lens, **1986–8;** motion pictures, **2341–56;** the negative, **2780;** photomechanical processes, **1170–2;** submarine, **2342;** "telegraphing" pictures, **3174.**
**Photogravure** (*fō-tō-ġrā-vūr'*) **process, 1172.**
**Photolithog'raphy, 1172.**
**Photo-mechanical engraving, 1169–72.**
**Photom'eter,** for measuring intensity of light; astronomical type, **2003.**
**Photomi'crograph,** photograph taken with a microscope, *picture,* **474;** in motion pictures, **2342.**
**Pho'tosphere,** light-giving layer of sun, **3395.**
**Photosyn'thesis,** in plants, transformation by sunlight and chlorophyll of carbon dioxide and water into carbohydrates, **2823–4, 1980.**
**Photot'ropism,** among plants, **2827–8;** of bean plant, *pictures,* **348;** how a leaf "sees" the light, **1980–1;** of water-lily, *picture,* **2828.**
**Phrase,** in grammar, **3175;** prepositional, **2912–3.**
**Phrenol'ogy, 2784.**
**Phrygia** (*frĭġ'ĭ-ȧ*), anc. country of w. Asia Minor; extent varied at different periods; overrun by Cimmerians 7th cent. B.C.; later ruled by Lydia, Persia, Macedon, and Rome; music and orgiastic rites influenced Greeks; *map,* **1518.**
**Phycomycetes** (*fī-kō-mī-sē'tēz*), a class of fungi, **1382, 3938;** includes downy mildews and black molds, **2236.**
**Phylloxera** (*fĭl-ŏks-ē'rȧ*), or grape aphid, an insect parasite, **154, 1501.**
**Phylogeny** (*fī-lŏġ'ē-nĭ*), ancestral history of a species or race; of plants, **473;** rehearsed in animal embryos, **1209.**
**Phy'lum,** a major division in biological classification, **412.**
**Physical chemistry,** covers "borderline" between physics and chemistry, **715;** electrolysis, a typical study, **1125.**
**Physical geography.** *See in Index* **Physiography.**
**Physical training, 2784–5;** athletics, **251–2;** folk-dances, **1316–9;** hy-

gienic value of exercise, **1713**; influence on Greek sculpture, **1529**; setting-up exercises, *pictures*, **2785**; why violent exercise after meals is harmful, **1617**.

**Physician** (*fi-zish'ăn*), work of, **2192–3**.

**Phys'ics,** science of matter and energy, **2786–7, 3144,** *Study Outline*, **4027–38**; air, **50–3**; atoms and electrons, **256**; centrifugal force, **682**; conservation of energy, **1148–9**; Einstein theory of light deflection, **2000–1**; electricity, **1108–16, 1117–22**; ether theory, **1180**; Faraday's discoveries, **1224**; friction, **1370**; Galileo's work, **1391–2**; gases, **1403, 50–3**; gravitation, **1506–9**; heat, **1617–21**; how earth was weighed, **1064**; hydraulics, **1710**; light, **1997–2003**; lightning, **2006–7**; liquefying gases, **2025**; magnets and magnetism, **2121–3**; mechanics, **2187–90**; Newton's work, **2476–8**; pneumatics, **2847**; Ptolemy's contribution, **2932**; radium and radio-activity, **2958–61**; relation to chemistry, **710**; sound, **3276–8**; Tyndall's contributions, **3572**; vacuum, **3614**; wave motion, **3705–6, 3276**; X-rays, **3824–6**.

**Phys'iocrats, 1078.**

**Physiog'raphy,** the science dealing with the form of the earth's surface, **2787–92,** *Study Outline*, **3862–5**; avalanches, **288**; canyons, **639**; factors affecting climate, **794–5, 3532**; continents, origin of, **1420, 2516**; coral reefs and atolls, **884–6**; deltas, **3023**; the Earth, **1058–64**; earthquakes, **1064–6**; flood-plains, **3023**; geysers, **1454–6**; glaciers, **1465–6**; icebergs, **1721–2**; lakes, origin, **1957**; "meanders," **3023**; mesas, **844**; mountains, **2357–8**; oceans, **2552–9**; relations with geology, **1417**; rivers, **3022–3**; sand dunes, **3121–2**; soil formation, **3272–3**; springs, **3331**; valley formation, **3615**; volcanoes, **3657–60**; work of winds, **3750, 3751**.

**Physiology** (*fĭz-ĭ-ŏl'ō-jĭ*) **and anatomy, 2792–7, 121, 398–9,** *Study Outline*, **3998**; arm compared to horse's leg, *picture*, **1682**; blood and circulation, **437–8, 1615–7, 2933, 2999, 10**; body heat, **2611–2, 1621, 3246**; bones, **452, 3244–5**; brain, **486–92**; cells the units of body structures, **672, 398**; diaphragm, **1005**; digestion, **1010–1, 2724, 3360**; ear, **1056–7**; enzymes, **1172–3**; eye, **1213–6**; foot, **1322–4**; glands and their work, **1469–70**; habit formation, **1557**; hair, **1560**; hand, **1571–2**; heart, **1615–7, 2933**; kidneys, **1922**; liver, **2031**; lungs, **2083**; mind and body, **2247**; muscles, **2372–3**; nails of fingers and toes, **1680**; nerves, **2436–7, 1557**; protoplasm the basis of life, **398**; pulse, **2933**; respiration, **2998–9, 2083**; skeleton, **3244–5**; skin, **3246**; sleep, **3250–1**; smell, **3252**; stomach, **3360, 1010–1, 2724**; taste, **3440**; teeth, **3452–4**; tongue, **3513**; touch, **3520–1**; voice, **3656–7**. *See in Index* **Disease; Food; Food values; Germ Theory of Disease; Hygiene**; and the chief topics above by name.

**Physiology,** of plants, **2797, 473, 2823–30**.

**Physop'oda,** insect order containing thrips, **1788**.

**Phytoflagella'ta,** group of unicellular animals containing chlorophyll, **3944**; often considered plants. *See in Index* **Volvocales**.

**Pi** (*pī*), a Gk. letter (written $\pi$) used as symbol in geometry, **1423**.

**Piacenza** (*pē-ä-chĕn'dzä*). Fortified town in n.-cent. Italy on Po R.; pop. 41,000; founded by Romans as Placentia 218 B.C.; a leading town of Lombard League in Middle Ages.

**Piankishaws** (*pĭ-ăn'kĭ-shąz*). Indian tribe of Algonquian group, once a branch of Miamis; controlled lower Wabash valley.

**Piano** (*pē-ä'nō*), **2797–2801, 2381**; Handel's harpsichord, *picture*, **2380**; how made, *pictures*, **2799–2800**.

**Piano player,** how it works, *picture*, **2798**.

**Piave** (*pē-ä'vā*), r. of n.e. Italy; rises in Carnic Alps and joins Adriatic 20 mi. n.e. of Venice; length 130 mi.; *map*, **1836**; scene of desperate fighting in World War, **3798, 3807, 3810**.

**Piazzi** (*pē-ät'sē*). **Giuseppe** (1746–1826), Ital. astronomer; discovers Ceres, **237**.

**Picardy** (*pĭk'ăr-dĭ*), old province of n. France; contained towns of Amiens (cap.) and Boulogne, and battlefields of Agincourt, Crécy, St. Quentin; World War battle March–April 1918, **3275, 3810**.

**Picaresque** (*pĭk-ă-rĕsk'*) **novel, 2539**.

**Picasso** (*pē-käs'sō*), **Pablo** (born 1881), Span. painter, **2634**.

**Pi'ca type, 3572**.

**Pic'cadilly Circus,** London, **2055**.

**Pic'colo,** a small flute, **3781, 2591**.

**Picea** (*pĭs'ē-ă*), the spruce genus of trees, **3332**.

**Picher,** Okla. Lead and zinc mining town in n.e. corner of state; pop. 9676.

**Pichincha** (*pē-chĕn'chä*). Volcano on w. slope of Andes near Quito, Ecuador (highest peak 15,918 ft.); battle between patriots and Spaniards which freed Ecuador was fought on its slopes May 24, 1822.

**Pichola** (*pē-chō'lä*), lake in native state of Udaipur, India; Rajput palaces, *picture*, **1755**.

**Pici** (*pī'sī*), woodpecker order of birds, **412**.

**Picidae** (*pĭs'ĭ-dē*), the woodpecker family, **3780**.

**Pick'ens, Francis Wilkinson** (1805–69). Amer. statesman, extreme advocate of states' rights; as gov. of S. Carolina (1860–62) demanded surrender of Ft. Sumter and ordered erection of batteries which caused its surrender.

**Pick'erel,** a fresh-water fish, **1278**.

**Pickerel weeds, 3700**.

**Pick'ering, Edward Charles** (1846–1919). Amer. astronomer, b. Boston; great-grandson of Timothy; devoted particular attention to the study of light and spectra.

**Pickering, Timothy** (1745–1829). Amer. statesman, b. Salem, Mass.; member of "Essex Junto" and Hartford Convention; as sec. of war (1795) established West Point Military Academy.

**Pickett, George Edward** (1825–75), Amer. Confederate general, b. Richmond, Va.; at battle of Gettysburg, **1453**; defeated at Five Forks, **3205**.

**Pickles,** made from cucumbers, **939**.

**Pickthall, Marjorie Lowrey Christie** (born 1883), Canadian poet, **624**.

**'Pickwick Papers',** novel by Dickens; story, 'Mr. Pickwick and the Pickwick People', **1007–10**.

**Picric acid, 641, 1212**.

**Picts,** people of disputed origin, early inhabitants of Scotland, **3147, 3148**; invade Britain, **1152**; in Shetland Isls., **3206**.

**Pictured Rocks,** L. Superior, **1513, 2226**.

**Picture writing.** *See in Index* **Hieroglyphics; Ideographic writing**.

**Pid'dock,** a boring mollusk, *picture*, **3202**.

**Pie,** a copper coin of India, **1752**.

**Pied-billed grebe, 1515,** *pictures*, **413, 407**.

**Piedmont** (*pēd'mŏnt*), division of n. w. Italy; comprises provinces of Turin, Novara, Alessandria, and Cuneo; 11,336 sq. mi.; pop. 3,509,000; **1840**; cap. Turin, **3555**; annexed by Napoleon I, **2394**; nucleus of united Italy, **3127, 3638, 1837, 670, 1399, 2178**.

KINGS OF SARDINIA AND PIEDMONT AND OF UNITED ITALY

| | |
|---|---|
| 1720-30 | Victor Amadeus I |
| 1730-73 | Charles Emanuel I |
| 1773-96 | Victor Amadeus II |
| 1796-1802 | Charles Emanuel II |
| 1802-06 | Victor Emanuel I |
| [1805-13 | Sardinia part of the kingdom of Italy under Napoleon I] |
| 1814-21 | Victor Emanuel I (restored) |
| 1821-31 | Charles Felix |
| 1831-49 | Charles Albert |
| 1849-78 | Victor Emanuel II (King of Italy, 1861) |
| 1878-1900 | Humbert |
| 1900- | Victor Emanuel III |

**Piedmont region,** a name (means "at the foot of the mountains") used for that part of the Atlantic coast plain between the Appalachian Mts. and the coastal plain, **1413**; in Ga., **1431**; Md., **2160**; Pa., **2718**; N.C., **2518**; S.C., **3290**; Va., **3647–8**.

**Pied Piper of Hamelin.** Magician in Ger. legend who, by his piping, charmed the rats of Hamelin into following him into the river; because he was not paid he lured the children of the city away; story used by Browning in poem of same name.

**Pieplant** or **rhubarb, 3012–3**.

**Piepowder courts, 1219**.

**Pierce, Charles Sanders** (1839–1914), Amer. physicist and philosopher; first formulated pragmatism, **2773**.

**Pierce, Franklin** (1804–69), 14th president of U.S.; **2801–2**; Gadsden Purchase, **3604,** *map*, **3605**; Perry's treaty with Japan, **1862, 1240**; Kansas-Nebraska Act, **1913, 1027**; Brook's assault on Sumner, **3392**; border warfare in Kansas and Osawatomi massacre, **1913, 516**; Republican party formed, **2870, 2012**; Jefferson Davis, sec. of war, **967**.

**Pierian** (*pī-ē'rĭ-ăn*) **Spring.** In Gk. myth., fountain of the Muses in Pieria, a region of Macedonia; supposed to give poetic inspiration.

**Pierre** (*pēr*), S.D., cap. of state, on Missouri R. in farming, natural gas, and oil region; pop. 3209; cattle shipping interests; govt. industrial school for Indians; **3296**; capitol, *picture*, **3295**.

**Pierrot** (*pyĕ-rō'*). Idealized clown in Fr. pantomime, similar to Ital. Harlequin.

**Piers Plowman.** *See in Index* **Langland, William**.

**Pietermaritzburg** (*pē-tēr-mä'rĭts-bûrg*). Cap. of Natal, 40 mi. n.w. of Durban; pop. 35,000.

**Pig.** *See in Index* **Hog**.

**Pigafetta** (*pē-gä-fĕt'tä*), **Antonio** (1491–1534?), companion of Magellan, **2116**.

**Pigeons and doves, 2803–6**; as pets, **2758**; care of young, **408**; dodo a relative, **1017**; feathers, **1229,** *picture*, **1228**; head, *picture*, **410**; homing instinct, **130**; length of life, **126**; mourning dove, *pictures*, **415, 2411**; story, 'The Pigeon that Won a War Medal', **2806**; taking air photographs, *picture*, **2778**.

**Pig iron, 1820**.

**Pigment,** of skin, **3246**.

**Pigments,** in paints, **2642**.

**Pigmies,** in Africa, **38**; New Guinea, **2451**; Philippines, **2765**.

**Pigmy grass, 1502**.

**Pigmy shrew, 2279**.

**Pig-nut,** a hickory, **1649**.

**"Pig-sticking,"** or boar-hunting, **440**.

**Pig-tail ape, 3391,** *picture*, **2288**.

**Pigtails** or **queues,** in China, **742**; 18th cent. dress, **898, 900**.

**Pig weed.** A coarse persistent weed of the goosefoot family, growing from 2 to 3 ft. high; it has large leaves, sometimes covered with stiff hairs, and spikes of small greenish flowers.

**Pi'ka** or **cony, 1585**.

**Pike, Zebulon Montgomery** (1779–1813,, Amer. general and explorer; survcyed upper Mississippi R. 1805; Missouri and Arkansas rivers 1806; first to view mountain called for him "Pikes Peak"; explorations, **844, 1803,** *map,* **3605.**
**Pike,** a food fish, **1278.**
**Pikes Peak,** famous peak of Rocky Mts. near Colorado Springs, Colo.; 14,108 ft.; discovered 1806 by Zebulon M. Pike; **842,** *pictures,* **843;** how formed, **2358;** vegetation, **3035.**
**Pikes Peak Highway, 3026,** *picture,* **3024.**
**Pilaf',** a Turkish dish, **1527.**
**Pilate** (*pī'lăt*), **Pontius** (first cent. A.D.), Rom. governor of Judaea; gives up Jesus to be crucified, **1888.**
**Pil'chard,** the true sardine, **3126.**
**Pilcomayo** (*pēl-kō-mä'yō*) **River,** in Bolivia and Paraguay; flows 1000 mi. from the Andes to the Paraguay R.; *map,* **3608.**
**Pileated** (*pī'lē-āt-ĕd*) **woodpecker, 3781,** *picture,* **3780.**
**Pil'grimage of Grace,** insurrection in England (1536), **1636.**
**Pilgrim Fathers,** founders of Plymouth Colony, **2175–8, 2841–3, 2937;** first Thanksgiving, **3482;** Miles Standish, **3338;** Psalms, **2379;** story, 'Children of the Pilgrims', **2844–6.**
**Pilgrims, 2807;** Canterbury, **358, 637, 701;** and Crusades, **929;** Mohammedan, **2187,** *pictures,* **2186;** pilgrimage centers in Asia, **232;** protected by Crusading orders, **932;** scallop shell a badge, **3134.**
**'Pilgrim's Progress',** allegory by John Bunyan, **534, 1165, 2539;** story retold, **535–8.**
**Pilica** (*pē-lēt'sä*) **River,** Poland, **3651.**
**Pillars of Hercules,** in anc. geography, the 2 promontories, Gibraltar in Europe and Abyla in Africa, at e. extremity of Strait of Gibraltar, **1458;** legendary origin, **1640.**
**"Pill boxes,"** machine gun nests in World War, **193.**
**Pillcorn,** name for oats, **2549.**
**Pil'lory,** instrument of punishment, **2919.**
**Pillow, Fort.** *See in Index* **Fort Pillow.**
**Pillow** or **bobbin lace, 1949.**
**Pilot blacksnake, 3260.**
**Pilot snake, 884.**
**Pilsen** (*pĭl'zĕn*) or **Plzen.** The 3d city of Czecho-Slovakia, 53 mi. s. w. of Prague; pop. 82,000; fine buildings, famous breweries; steel, machinery, and guns.
**Piltdown skull, 2133.**
**Pimen'to.** Same as **Allspice.**
**Pimien'tos,** sweet red peppers, **2723.**
**Pimples,** cause of, **3652.**
**Pin, 2807.**
**Pinaceae** (*pī-nā'sē-ē*), family of coniferous trees, **3938.**
**Piña** (*pē'nyä*) **cloth, 2809.**
**Pinar del Rio** (*pē-när'dĕl rē'ō*), Cuba. Inland city 85 mi. s.w. of Havana; pop. 49,000; tobacco center.
**Pince-nez** (*păns-nā'*), or eye-glasses, **3310.**
**Pinchot** (*pĭn'shō*), **Gifford** (born 1865), Amer. forestry expert and pioneer conservationist, b. Simsbury, Conn.; leading Progressive in 1912; elected gov. of Pennsylvania 1922; **870.**
**Pinckney** (*pĭnk'nĭ*), **Charles** (1758–1824), Amer. statesman, gov. of S. Carolina 1789–92, 1796–98, 1806–08; as minister to Spain (1802–05) he secured renunciation of Spanish claims to Louisiana Territory; in Constitutional Convention, **3593.**
**Pinckney, Charles Cotesworth** (1746–1825), Amer. statesman, b. Charleston, S.C.; minister to France 1796–97; candidate for president, **2107;** defeated for vice-president, **14;** X Y Z negotiations, **3826.**
**Pin'dar** (518–446? B.C.), Gk. lyric poet, master of "the grand style in simplicity," **1536, 86.**
**Pindar'ics.** Loose and irregular odes, in imitation of Pindar, fashionable in England at close of 17th and beginning of 18th cent.
**Pin'dus Mts.,** main range of Greece running from n.w. to s.e.; source of principal rivers in Greece; **307,** *map,* **308.**
**Pine,** a cone-bearing tree found chiefly in northern hemisphere; **2807–9, 3539;** cones and needles, *picture,* **1226;** distribution of forests, **1327;** Douglas spruce or fir, **3332;** in Japan, **1863;** in swamps, **3700;** turpentine, **3561;** wood-tar, **3436.** —*In U.S.:* annual cut, **3590;** Birmingham, Ala., **427;** Ga., **1431, 1432,** *picture,* **1433;** Idaho, **1727;** La., **2070;** Minn., **2256;** Ore., **2594;** S.C., **3291–2;** Tex., **3473;** Wash., **3687.**
**Pineapple, 2809;** Hawaiian industry, **1603;** plantation, *picture,* **1604.**
**Pineapple melon, 2196.**
**Pine Bluff,** Ark. Industrial city on Arkansas R. 38 mi. s.e. of Little Rock; pop. 19,280; cotton and lumber trade; cotton and iron products, lumber and staves; damaged by Confederate artillery (1863) in unsuccessful attack upon Union forces.
**Pineda** (*pē-nä'dà*), **Alonso Alvarez de,** Span. explorer of America; route, *map,* **1296–7.**
**Pine family.** Same as **Pinaceae.**
**Pine Islands, 1863.**
**Pine marten, 2156.**
**Pine Ridge Reservation,** S.D., **3296.**
**Pinero** (*pī-nĕr'ō*), **Sir Arthur Wing** (born 1855), Eng. playwright, one of most skilful dramatic craftsmen of his day, **1892;** chief works, **1038.**
**Pines, Isle of,** fertile isl. belonging to Cuba, about 40 mi. s. of w. coast; 840 sq. mi.; pop. 3300; cap. Nueva Gerona; *map,* **938.**
**Pine Tree State, 2125.**
**Pingyang',** Korea. Walled city 40 mi. from w. coast; pop. 175,000; great strategic importance.
**Pink,** a flower, **2809;** carnation, **645;** moss pink, a phlox, **2773.**
**Pink coral, 884, 886.**
**Pin'kerton, Allan** (1819–84). Amer. detective, b. Glasgow, Scotland; organized (1861) Federal secret service and founded a famous private detective agency.
**Pin'nate leaves, 1981.**
**Pin oak, 2547.**
**Pinsk.** City in Russia; pop. 40,000; on the Pripet R., in marshy region 105 mi. e. of Brest-Litovsk; formerly cap. of separate principality; captured by Germans 1915.
**Pint,** a unit of measure, **3715.**
**'Pin'ta'.** One of the 3 caravels used by Columbus on his first voyage to America.
**Pin-tail duck,** *picture,* **1045.**
**Pinto** (*pēn'tō*), **Fernão Mendes** (1509–83). Portuguese adventurer; companion of Francis Xavier on mission to Japan; his description of unknown Japan, long regarded as a sort of Munchausen yarn, "did for prose of Portugal what Camoens did for poetry."
**Pintsch gas, 1407.**
**Pinturicchio** (*pēn-tu-rēk'kē-ō*) ("little painter"). "Easel name" of Bernardino di Betti (1454–1513), Ital. artist, one of the foremost painters of Umbrian school.
**Pi'nus,** pine genus of trees, **2809.**
**Pinwheels,** revolving fireworks, **1264.**
**Pin'yon** or **piñon tree,** a nut-pine of s.w. U.S., **2464;** nut, **2545.**
**Pinzon** (*pēn-thōn'*), family of Span. navigators, 3 of whom, Martin Alonzo, Francisco, and Vicente Yañez (brothers), were companions of Columbus in discovery of Amer.; Vicente discovers Brazil, **496,** *map,* **110.**
**Piom'bo, Sebastiano del.** *See in Index* **Sebastiano del Piombo.**
**Pioneer tunnel,** a construction device, **3551.**
**Pipe, tobacco:** briarwood, **1621;** Chinese, *picture,* **742;** corn cob, **890,** *picture,* **891;** Iroquois Indians, *picture,* **1766;** meerschaum, **2194;** oriental hooka, *picture,* **2735.**
**Pipefish family,** the *Syngathidae;* includes pipefishes (long slender fishes with tubular snouts) and sea-horses, **3165.**
**Pipe lines,** for petroleum, **2754, 1794,** *picture,* **2753.**
**Pipe organ, 2598–2600, 2383,** *pictures,* **2598, 2599, 2382.**
**Pip'it,** a titlark, **3505,** *picture,* **419.**
**Pippa** (*pĭp'à*). In Browning's poem 'Pippa Passes', a little Ital. mill girl whose songs on her one holiday of the year unconsciously influence several hearers to choose good instead of ill at momentous crises in their lives.
**Pippin.** Same as **Pepin.**
**Piqua** (*pĭk'wà*), Ohio. Industrial center on Miami R. and Miami and Erie Canal, 70 mi. n.w. of Columbus; pop. 15,044; oil-mill machinery, strawboard, woolen goods, iron products, furniture.
**Piraeus** (*pī-rē'ŭs*), 2d largest city and chief port of Greece, 5 mi. s.w. of Athens; pop. 74,000; **249, 251;** anc. fortifications and long walls, **249, 1522, 1525.**
**Pirates and piracy, 2810;** attack on *Independence* repelled by fireworks, **1264;** Barbary States, **971, 3541;** Caribbean Sea, **644, 835;** Captain Kidd, **1921–2;** Northmen, **2525–8;** Pompey drives from Mediterranean, **2878;** Vandals, **3618.**
**Pirithoüs** (*pī-rith'ō-ŭs*), king of Lapithae, friend of Theseus, **3487;** battle of centaurs at marriage feast, **678.**
**Pirna** (*pēr'nä*). Town of Saxony, Germany, on Elbe R. 11 mi. s.e. of Dresden; pop. 21,000; Prussians defeated Saxons in Seven Years' War Oct. 17, 1756.
**Pisa** (*pē'zä*), city in n. Italy; pop. 68,000; famous for leaning tower; **2810–1, 1844;** baptistery, *picture,* **1848;** cathedral, **3178,** *picture,* **184;** history, **2810–1, 3127, 1412;** leaning tower, **2810, 1509,** *picture,* **1509;** Pisano's pulpit, *picture,* **1205.**
**Pisa, Council of** (1409). Church council which deposed rival popes Gregory XI and Benedict XIII; Alexander V elected.
**Pisano** (*pē-zä'nō*), **Andrea** ("Andrew of Pisa") (1270?–1348?). Ital. sculptor, pupil of Giovanni Pisano; made bronze doors on south side of Baptistery at Florence.
**Pisano, Giovanni** ("John of Pisa") (1250?–1330). Ital. sculptor, one of greatest of Renaissance, founder of Ital. Gothic style; son of Niccolo Pisano.
**Pisano, Niccolo** ("Nicholas of Pisa") (1206?–78), Ital. sculptor and architect, "first great precursor of the Renaissance"; pulpits, *pictures,* **1201, 1205.**
**Piscat'aqua,** r. forming s. part of boundary between Maine and New Hampshire; flows into Atlantic 3 mi. s.e. of Portsmouth; **2454.**
**Piscat'aquog,** small r. in New Hampshire, tributary of Merrimack, **2454.**
**Pisces** (*pĭs'ēz*), class of vertebrates including fishes, **3948.**
**Pisces,** a sign of the zodiac, **3840.**
**Pisgah** (*pĭz'gà*). Mt. in Palestine from which Moses saw the Promised Land; identified with Nebo (Deuteronomy xxxiv, 1).
**Pisidia** (*pī-sĭd'ĭ-à*). Anc. dist. of s. Asia Minor; mountainous, with wild and warlike inhabitants who kept independence against all successive rulers of Asia Minor until reduced by Rome.

**Pisistratus** (*pĭ-sĭs'trà-tŭs*) or **Peisistratos** (605?–527 B.C.), "tyrant" of Athens, **1521–2**; in Aesop's fable, **30**.
**Pissaro** (*pē-sà-rō'*), **Camille** (1831–1903), Fr. painter and etcher of impressionist school, **2633**.
**Pistachio** (*pĭs-tä'shĭ-ō*) **nut**, **2546**, *picture*, **2545**.
**Pis'til**, seed-developing structure in flowers, **1304**.
**Pis'tol**. In the 'Merry Wives of Windsor', a swaggering bully, companion of Falstaff.
**Pistol**, a small firearm, **1256**.
**Pis'ton**, in steam engine, **3348**, **3350**, **3351**.
**Pistons**, or valves, of musical instruments, **1680**, **1681**.
**Pi'sum sat'ivum**, the garden pea, **2698**.
**Pit**, in Board of Trade, **440**.
**Pit'cairn, John** (1740–75), Brit. army officer, commanding Gage's troops in expedition to Lexington and Concord, **1990**; killed at Bunker Hill.
**Pitcairn Island**, in s. Pacific Ocean; story of settlement, **2624**.
**Pitch** (sound), **3278**; how ear perceives it, **1057**; of voice, affected by vocal cords, **3657**.
**Pitch** (substance), **3436**, **814**.
**Pitch, mineral**, or asphalt, **234–5**.
**Pitch'blende**, a uranium ore, source of radium, **2960**.
**Pitcher, Molly** (d. 1832). Heroine of Rev. War; said to have been made sergeant by Washington for taking place of her fallen husband and serving his cannon at battle of Monmouth. According to another story she won her nickname by carrying water to soldiers.
**Pitcher**, in baseball, **338**, **340**, *pictures*, **339**.
**Pitcher plants**, **2811**, *picture*, **2829**.
**Pitch Lake**, Trinidad, **3541**, *pictures*, **234**, **235**.
**Pith**, spongy core of many plant stems; of corn, **890**; of trees, *picture*, **3531**.
**Pithecanthro'pus erec'tus**, the "missing link," **153**, **2133**.
**Pitiscus, Bartholomaeus** (1561–1613), invents decimal point, **975**.
**Pitman, Sir Isaac** (1813–97). Eng. inventor of Pitman system of shorthand, and advocate of simplified spelling, **3224**.
**Pitt, William**, the Elder. *See in Index* **Chatham, Earl of.**
**Pitt, William**, the Younger (1759–1806), Eng. statesman, **2812**, **1430**.
**Pit'tacus** (d. 569 B.C.), statesman of Mytilene; hero of war against Athens; as popularly elected ruler (589–579) restored order following civil strife; one of 7 sages, **3275**.
**Pitt** or **Regent diamond**, famous Fr. crown jewel, **1005**.
**Pitti** (*pēt'tē*) **Palace**, in Florence, **1850**, **1293**.
**Pittsburg**, Kan. Coal-mining city 120 mi. s. of Kansas City; pop. 18,052; r.r. shops, foundries, machine shops, zinc smelters, clay works.
**Pittsburgh**, Pa., 9th city of U.S.; pop. 588,343; **2812–3**; Carnegie plants, **646**, **1826**.
**Pittsburgh, University of.** At Pittsburgh, Pa.; non-sect., co-ed.; chartered 1787 as academy, 1819 as univ.; present name 1908; arts and science, engineering, education, law, medicine.
**Pittsburg Landing, battle of.** *See in Index* **Shiloh.**
**Pittsfield**, Mass. Residential city and summer resort in Berkshire Hills and lake region, 35 mi. n.w. of Springfield; pop. 41,763; foundry products, electrical machinery, textiles, paper.
**Pittston, Pa.** Industrial city on Susquehanna R. 8 mi. n.w. of Wilkes-Barre in anthracite coal region; pop. 18,497; flour, paper, knitted goods, foundry products; named for William Pitt.
**Pituitary** (*pĭt'yụ-ĭ-tā-rĭ*) **gland**, **1469**, **1470**, **491**.
**Pit vipers**, a sub-family of poisonous snakes, **3646–7**, **3259**; copperhead, **884**; moccasin, **2274**; rattlesnake, **2978**.
**Pi'us I** (d. 154 A.D.), pope, **2813**.
**Pius II** (1405–64), pope, **2813**, **811**.
**Pius III** (1439–1503), pope, **2813**.
**Pius IV** (1499–1565), pope, **2813**.
**Pius V** (1504–72), pope, **2813**, **2191**.
**Pius VI** (1717–99), pope, **2813**.
**Pius VII** (1742–1823), pope, **2813**.
**Pius VIII** (1761–1830), pope, **2813**.
**Pius IX** (1792–1878), pope, **2813–4**, **1838**.
**Pius X** (1835–1914), pope, **2814**.
**Pius XI** (born 1857), pope, elected in 1922, *picture*, **2814–5**.
**Piute** (*pī-yut'*) **Indians**, a Shoshone tribe of Nevada, **2445**; story, 'The Dream of Chief Winnemucka', **2447–8**.
**Pizarro** (*pĭ-zär'ō*), **Francisco** (1471?–1541), Span. conqueror of Peru, **2814**, **1741**; and Charles V, *picture*, **3301**; introduces potato to Europe, **2900**.
**Place de la Concorde** (*pläs dē lä kôn-kôrd'*), Paris, *picture*, **2682**.
**Place de l'Etoile** (*lā-twäl'*), Paris, *pictures*, **2683**, **2681**.
**Place de l'Opéra**, Paris, **2682**, *picture*, **2683**.
**Placen'tal mammals** or **Placentalia**, **2132**, **3950**.
**Placer mining**, **2250**, **1479–80**, **1040**, *pictures*, **78**, **265**, **1039**, **1481**.
**Plague.** *See in Index* **Bubonic plague.**
**Plaice** (*plās*), or flounder, a flatfish, **1301**, **1289–91**.
**Plainfield**, N.J. City 22 mi. s.w. of New York City; pop. 27,700; metal novelties, printing presses, automobiles, silks, airplanes, machine tools.
**"Plain living and high thinking,"** **1522**.
**Plains**, defined, **2788**, **2790**; North Sea a drowned plain, **1191**, **2528**.
**Plains Indians**, name given to group of tribes inhabiting great plains of U.S., **1766–7**.
**Plains of Abraham**, **3775**, **2949**.
**Plane, focal**, of lenses, **1987**.
**Plane, inclined**, in mechanics, **2187–90**.
**Plane geometry**, **1422**.
**Planer**, a machine tool, **3514**.
**Plane surveying**, **3397–8**.
**Planetes'imal theory**, that planets were made of meteorites (planetesimals), **2819**, **2433**, **1417**; supported by chemical nature of sun, **3395**.
**Plan'etoids.** Same as **Asteroids.**
**Plane-tree**, **3424**; classified, **3533**.
**Plan'ets**, **2815–9**, **240**, **242–7**; asteroids, **237**; earth, **1058–64**; gravitation, **1506–9**; Kepler's laws of motion, **1921**; nebular theory, **2433**; Neptune discovered, **244–7**; planetesimal theory, **2819**, **2433**, **1417**, **3395**.
**Planing mill**, **3514**, **3516**, *picture*, **2081**.
**Plank'ton**, the microscopic organisms found in ocean water, **2558**; of Newfoundland Banks, **2450**.
**Plant.** *See in Index* **Plant life.**
**Plantagenet** (*plăn-tăj'ĕ-nĕt*), **House of**, line of Eng. kings ruling 1154–1399; also called House of Anjou; founded by Henry II, **1633**; list of kings, **1152**.
**Plantain** (*plăn'tĭn*), a perennial weed with oval leaves; seed stalks, *picture*, **2416**.
**Plantain**, a type of banana tree or its fruit, **324**; in India, **1748**; yields Manila hemp, **2769**, **1630**.
**Plant breeding**, **473**, **44**, **46–7**, **2830**; asparagus, **234**; Burbank's work, **538–9**; cabbage and its relatives, **553–4**; cannas, **630–1**; carnation, **645**; celery, **671**; in China, **749**; chrysanthemum, **762**; corn, **890–1**; cosmos, **895**; dahlia, **949**; date palms, **966**; grafting fruit trees, **1377**, *picture*, **1379**; grains, **2830**; grapes, **1501**; magnolia, **2123–4**; Mendel's laws of heredity, **1642**; oranges, **2588**; pansies, **2664**; blight-proof pears, **2701**; potato, **2901**; roses, **3066**; rust and smut-proof grain, **3100–1**; strawberries, **3370**; sugar beet, **365**.
**Plan'tigrade animals**, those whose heels touch the ground, **1322**; bear, **349**; distinguished from digitigrades, **1682**; raccoon, **2951**.
**Plant Industry, Bureau of**, U.S., **3600**.
**Planting and transplanting**, **1394–5**; table, **1397**.
**Plant lice.** Same as **Aphids.**
**Plant life**, **2820–31**, *Study Outline*, **3847–58**; "Adams" of the plant world (algae), **90–2**, **2822**; adaptation to surroundings, **2826–9**, **1076**, **946**, **562**; affected by altitude, **3035**, **795**, **1207**, **2972**, **562**; alternation of generations, **1232–4**, **2338–40**, **2032**; animal life depends upon plants, **2823–4**, **396**, **2511**; animals and plants distinguished, **2822**, **2823**, **393–4**, **127**, **3251**; of Arctic regions, **190**, **2820**, **3533**; Australia's strange forms, **265–6**; autumn coloration, **1981–2**, **3537**; bacteria, **302–3**, **396**; botanical classification, **2822**, **2831**, **3937–43**; breathing in plants, **2824–5**, **2998**, **1980–2**; bulbs and tubers, **532**; cells the structural units, **671–2**; cellulose, **673**; chemistry of plant life, **2824**, **1235**, **2511**, **642**, **673**, **2926**, *picture*, **2821**; elements needed for growth, **3273**, **1235**, **2511–2**, **2829**; flowers, **1304–11**; forest life, **1327–8**; fossil plants, **1334**, **1336**, **1418**, **1420**; fruits, **1380**; fungi, **2822**, **1382**; germination, illustrated by bean, **2827**, *pictures*, **348**; grasses as land makers, **1502–3**; greenness and its importance, **2823–4**, **394**; how to study, **2407–17**; hybridization, **538–9**, **2830**; insect-eating (carnivorous) types, **2829**, **2811**, **3396**, **3626**; "intelligence" of plants, **1305–6**; leaves, **1980–2**, **1207**, **3532**; legumes and nitrifying bacteria, **2511–2**, **89**; length of life, **2830**, **3530–2**; moisture affects form and life, **2828**, **1207**, **2972**, **946**, **562**; in ocean, **2555–8**, **398**; origin of higher plants, **90–2**; parasites and parasitism, **2677–80**; "partnerships" (symbiosis) among plants, **2829–30**, **1994**, **2511–2**; parts of typical plant, *picture*, **2822**; phosphorescence, **2776**; physiology of plants, **2797**; poisonous plants, **2852–4**; protoplasm the "life substance," **2926**, **394**, **398**; reproduction, **2822**, **394**, **395**, **671–2**, **1304–11**, **1232–4**, **2338–40**; roots, **2827–9**, **3063**, *picture*, **2824**; seaweeds, **3170–1**; seeds and spores, **3171–3**, **1380**; sensitive plants, **2829**, **3174**; as soil makers, **3273**, **2340**, **3532**; struggle for existence, **2827**, **2820**, **1327–8**; trees, **2830**, **3530–9**; water-plants, **3700**; weeds, **3712–3**; yeasts, **3828–9**. *See also in Index* **Botany**; **Ecology**; **Plant breeding**; and the chief topics above by name.
**Plants, sensitive**, **3174**, **2829**, **855**.
**Plant societies**, **473**, **1076**, **3700**.
**Plant surgery**, **3532**; grafting, **1377**, *pictures*, **1379**.
**"Plant wizard,"** nickname for Luther Burbank, **539**.
**Plasma**, the fluid of the blood, **437–8**.
**Plasmo'dium**, genus of unicellular animals containing malaria parasite, **3944**.
**Plasmodium**, a mass of naked protoplasm; in slime molds, **3251**.
**Plassey** (*pläs'ē*) or **Plassi**, small town of Brit. India, 75 mi. n. of Calcutta; battle (June 23, 1757), **796**, **1753**.
**Plaster of Paris**, **1554**; pottery molds, **2904**; use in sculpture, **3154**.

**Plastic materials,** in industry, those capable of being molded readily, **673, 784, 814.**
**Plataea** (*plă-tē'ȧ*), anc. city of Boeotia; assisted Athenians at battle of Marathon, **2739;** battle of (479 B.C.), **2740, 195.**
**Plata** (*plä'tä*) **River,** great estuary on e. side of S. Amer. formed by junction of Parana and Uruguay rivers, **2831;** at Buenos Aires, **525–6, 192;** at Montevideo, **2316.**
**Plate armor, 214,** *picture,* **215.**
**Plateau** (*plă-tō'*), **Joseph A.F.** (1801–83), Belgian physioist, **3267.**
**Plateau,** a land form, **2788, 2790.**
**Plate glass, 1472.**
**Plating, 1125.**
**Plat'inite, 2507, 2831.**
**Plat'inum,** a very heavy whitish chemical element, **2831–2;** in pyrometers, **2941;** wire, **3757.**
**Plato** (*plā'tō*) (427–347 B.C.), Gk. philosopher, pupil of Socrates, **2832, 1538;** and Arisotle, **195, 196;** description of Atlantis, **256;** and Socrates, **3270.**
**Platoon',** in U.S. Army, **218.**
**Platt, Thomas Collier** (1833–1910), Amer. politician, the "easy boss" (Republican) of N.Y. state; said to have forced Roosevelt's nomination 1900 for vice-president.
**Platte Purchase** (1837), **2273.**
**Platte River,** largest tributary of Missouri, formed by union of N. and S. Forks of the Platte in s.w. Nebraska; flows e. in great curves and enters Missouri R. on Iowa border; length of main stream 200 mi.; *map,* **2429;** early name, **2432.**
**Platt Park,** a national park in s. Oklahoma; 1⅓ sq. mi.; medicinal springs; *map,* **2400.**
**Plattsburg,** N.Y. Garrison town and summer resort on w. shore of L. Champlain, 74 mi. s.e. of Montreal; pop. 10,909; important naval battles of Rev. War and of War of 1812 fought near by; officers' training camp established there during World War.
**Plat'ypus,** the duckbill, an egg-laying mammal, **1046–7;** foot, *picture,* **1323.**
**Plauen** (*plow'ĕn*), town of Saxony, Germany, 21 mi. s.w. of Zwickau; pop. 105,000; chief center in Germany for mfr. of white cotton goods; lace mfrs., **1949.**
**Plautus** (*plą'tŭs*), **Titus Maccius** (254?–184 B.C.), Rom. comic dramatist, **1966, 1033;** chief works, **1038.**
**Play and games, 2832–8;** in kindergarten, **1923;** games for younger children, **2834–5;** games for older children, **2835–7;** indoor games for rainy days, **2837–8.** *See also in Index* **Sports and games.**
**Playgrounds, public, 2832,** *picture,* **2833.**
**Playing cards, 643–4.**
**Plays, dramatic.** *See in Index* **Drama.**
**Plebiscite** (*plĕb'ĭ-sĭt*) **areas,** certain regions whose permanent status was not fixed in treaties following World War but was left for inhabitants to decide by vote; in E. Prussia, Schleswig, Upper Silesia, and Klagenfurt (*see maps,* **1440, 997, 947, 308**) plebiscites were taken, but frontiers at Teschen, Orava, and Spiz were fixed by Council of Allied Ambassadors; Smyrna was to hold plebiscite 5 years after Treaty; Saar Basin, 15 years; results in E. Prussia and Silesia, **2857;** in Schleswig, **997.**
**Plebs** (*plēbs*) or **plebeians** (*plē-bē'ȧns*), the lower order of citizens of anc. Rome, **3042–4.**
**Plecop'tera,** an insect order including stoneflies, **1788.**
**Plec'trum, 2135.**
**Pleiades** (*plē'yȧ-dēz*), in Gk. myth. daughters of Atlas, **2838.**
**Pleiades,** a constellation, **2838,** *charts,* **873, 3343;** nebulac, **2432.**
**Pleistocene** (*plīs'tō-sēn*) **epoch,** in geology, **1420,** *picture,* **1419.**
**Plenipoten'tiary ministers, 1012, 1013.**
**Plesiosaur** (*plē'sĭ-ō-sąr*), type of extinct reptile, **2997.**
**Plev'na** or **Pleven** (*plā'vĕn*). Town in n. Bulgaria; pop. 25,000; celebrated for gallant resistance of Turks during siege in Russo-Turkish War (1877).
**Pliny** (*plĭn'ĭ*) **the Elder (Gaius Plinius Secundus)** (23–79 A.D.), Rom. historian and naturalist, **1967, 3841;** describes electrical phenomena, **1117;** glass, **1471;** soap, **3263.**
**Pliny the Younger (Gaius Plinius Caecilius Secundus)** (61–113), nephew of the elder Pliny; letters, **1967.**
**Pliocene** (*plī'ō-sēn*) **period,** in geologic time, **1418, 1420, 1277,** *picture,* **1419.**
**Ploësti** (*plō-ĕs'tē*) also **Ployeshti** (*plȯ-yĕsh'tē*). Town 40 mi. n. of Bucharest; pop. 58,000; petroleum center.
**"Ploughboy Poet," 542.**
**Plover** (*plŭv'ẽr*), a shore bird, **2838–9;** foot, *picture,* **409;** migrations of golden plover, **2839, 2231–2;** nests on ground, **406.** *See also in Index* **Killdeer.**
**Plow, 2839, 44;** gang plow, *picture,* **605;** primitive types, **3015,** *pictures,* **46, 2734.**
**"Plug-and-feather" method** of quarrying, **2944.**
**Plum,** a tree of the rose family, **2840;** Burbank, **538;** classified, **3533, 716, 1380;** pit contains hydrocyanic acid, **944;** related to sloe, **3251;** in U.S., **1379.** *See also in Index* **Prunes.**
**Plumage.** *See in Index* **Feathers.**
**Plumba'go.** Same as **Graphite.**
**Plumbing, 2840, 1715;** earthenware drain pipes, **2906, 505,** *picture,* **784;** lead pipes, **1974.** *See also in Index* **Sewerage; Waterworks.**
**Plumcot,** a Burbank fruit, **538.**
**Plumule** (*plą'mūl*), first bud of an embryo; of bean, *pictures,* **348.**
**Plunkett, Sir Horace Curzon** (born 1854). Irish publicist, perhaps the foremost advocate of compromise in the settlement of the Irish question; founded Irish Agricultural Organization 1894, and 1899–1907 was vice-president of Irish Agricultural Dept., through which he constantly labored to improve condition of Irish farmer.
**Plu'ral,** of nouns, **2537;** of verbs, **3627.**
**Pluralists,** in philosophy, **2773.**
**Plural'ity,** in elections, **1108–9.**
**Plush,** a fabric, **804.**
**Plutarch** (*plą'tärk*) (about 46–120 A.D.), Gk. biographer, **2840, 1538;** story of Lycurgus, **2086.**
**Plu'to** or **Hades,** in Gk. and Rom. myth., god of underworld, **2840, 1558.**
**Plymouth** (*plĭm'ŭth*), England, important port in s.w.; pop. 210,000; **2841.**
**Plymouth,** Mass., mfg. town on e. coast, first New England settlement; pop. 13,045; **2841–6, 2166;** Pilgrims settle at, **2175–6;** first Thanksgiving, **3482;** Miles Standish, **3338;** New England Confederation, **3592;** annexed to Massachusetts Bay Colony, **2170;** Roger Williams in, **3742;** story, 'Children of the Pilgrims', **2844–6.**
**Plymouth,** N.H., town 51 mi. n.w. of Concord; pop. 2353; makes buckskin gloves and shoe pegs; here Webster made first public appearance as a lawyer, **2456.**
**Plymouth,** Pa. Coal-mining borough on Susquehanna R., 4 mi. w. of Wilkes-Barre; pop. 16,500; mining machinery, hosiery.
**Plymouth Rock, 2842,** *picture,* **2841.**
**Plymouth Rock,** a breed of fowls, **2911,** *picture,* **2909.**
**Plzen.** *See in Index* **Pilsen.**
**P.M.** (Lat. *post meridiem*), **3501.**
**Pneumatic** (*nū-măt'ĭk*) **appliances, 2846–7, 52–3;** air brakes, **492–3;** dredges, **1041;** tubes, **2846, 1492,** *pictures,* **2846, 2897;** tunneling "shield," **3551–2;** vacuum cleaner, **3614.**
**Pneumatic tire, 3075–6.**
**Pneumatic tube carriers, 2846–7.**
**Pneumatics,** a branch of physics, **2847.**
**Pneumogastric nerve.** Same as **Vagus.**
**Pneumonia** (*nū-mō'nĭ-ȧ*), a lung disease; caused by bacteria, **1450;** serum treatment, **152.**
**Pnompenh** (*pnŏm-pĕn'*), commercial center and cap. of Cambodia, Fr. Indo-China, in s. on Mekong R.; pop. 85,000; **1777.**
**Pnyx** (*nĭks*), a hill in Athens, **251.**
**Po,** chief r. of n. Italy, **2848, 26,** *map,* **1836;** fertile valley, **1190, 1838, 2047.**
**Pocahontas** (*pō-kȧ-hŏn'tȧs*) (1595?–1617), Indian "princess," traditional ancestress of many Virginia families by her marriage to John Rolfe, a Jamestown settler; and Capt. John Smith, **3253.**
**Pocahontas coal, 3650.**
**Pocatel'lo,** Idaho. 2d largest city in state, on Portneuf R. in s.e.; pop. 15,001; extensive r.r. and live stock interests; wholesale trade; various mfrs.; Idaho Technical Institute.
**Pocket billiards** or **pool, 393.**
**Pocket borough, 2688.**
**Pocket compass, 853.**
**Pocket gopher, 1488–9.**
**Pocket veto, 3636, 1857.**
**Po'cono, Mt.,** Pa., long ridge in Monroe and Carbon counties, about 20 mi. s.e. of Scranton; 2000 ft. high; **2718.**
**Pod-corn,** variety having each kernel in a separate husk, **891.**
**Poe** (*pō*), **Edgar Allan** (1809–49), Amer. poet, critic, and short-story writer, **2848, 112,** *pictures,* **2849, 112;** description of Maelstrom, quoted, **3733;** grave at Baltimore, **322.**
**Poes'tenkill,** short crooked stream entering Hudson R. at Troy, N.Y., **3545.**
**Poet laureate, 2848.**
**Poetry, 2850–1, 2028;** beginnings in Greece, **1535;** Chaucer "father of English poetry," **702;** Dryden's theory, **1043;** Longfellow as the children's poet, **2057;** medieval minstrels and romances, **3039;** Wordsworth's theory, **3788.** *See also in Index* **American literature; English literature;** etc.
**Poet's Corner,** Westminster Abbey, **3719, 2054.**
**Poggio Bracciolini** (*pŏd'ġō brät-chō-lē'nē*) (1380–1459), Ital. scholar of Renaissance, **2996.**
**Pogy** (*pō'ġi*) or **menha'den,** a small fish, **1286, 1645, 3126.**
**Poi** (*pō'ē*), a food used in the Pacific isls., **1603, 2622.**
**Poilu** (*pwä-lü'*), **3248.**
**Poincaré** (*pwăn-kä-rā'*), **Henri** (1854–1912), **2852.**
**Poincaré, Lucien** (1862–1920), **2852.**
**Poincaré, Raymond** (born 1860), Fr. statesman, **2851–2.**
**Poinset'tia.** A shrub which reaches a height of 6 ft. or more and bears small yellow terminal flowers surrounded by flaring scarlet bracts often 9 in. long; it is native to Cent. Amer. and Mexico and is a favorite hothouse plant.
**Point Barrow,** Alaska, the northernmost cape of N. Amer.; whaling station; school for natives; average pop. about 500; *map,* **75.**
**Point d' Alençon** (*pwăn dȧ-lăn-sôn'*) **lace, 1950.**

**Point de Galle.** *See in Index* **Galle.**
**Pointe-à-Pitre** (*pwăn-tä-pē'tr*), Guadcloupe, chief seaport; pop. 23,000; ships cocoa, sugar, vanila; **1545.**
**Pointer,** a hunting dog, **1022, 1023,** *picture,* **1022.**
**Point Lo'ma,** Calif. Promontory at entrance to San Diego Bay; home of famous Theosophical colony under Katherine Tingley.
**Point Pleasant,** W. Va. Town on Ohio R. at mouth of Kanawha; pop. 3059; here Virginians defeated Indians Oct. 10, 1774; treaty followed by which Indians gavc up extensive tract s. of Ohio R.
**Point system** of type sizes, **3572.**
**Poison dogwood,** a plant, **2852.**
**Poison gas,** in warfare, **1408.**
**Poison hemlock, 2854.**
**Poison ivy, 2852, 1854;** distinguished from Virginia creeper, **3651.**
**Poison oak, 2852.**
**Poisonous animals:** centipedes, **679;** duckbill, **1046–7;** among fish, **1276;** Gila monster, **2037, 2035;** hydras, **1708,** *picture,* **1707;** scorpions, **3145;** sea anemones, **3164;** snakes, **3258–60;** spiders, **3326,** *picture,* **3323;** tarantula, **3436;** wasps, **3692.**
**Poisonous plants, 2852–4;** bittersweet, **432;** fruit pit kernels, **944;** hemlocks, **1630;** locoweed, **2854; 3712–3;** monk's hood, **2855;** mushrooms, **2374–5;** nightshades, **2509, 2855;** oleander, **2577;** strychnos trec, **3372;** sumach, **3391;** upas tree, **3532–3;** yew, **3830.**
**Poisons, 2854–5;** antidotes, **1270, 2854, 2855;** antimony salts, **150;** arsenic compounds, **220;** bichloride of mercury, **2200;** carbolic acid, **641;** carbon monoxide, **642;** chlorine, **755;** copper compounds, **881;** hydrocyanic acid and cyanides, **944;** lead compounds, **1974;** phosphorus, **2776;** snake venom, **3260.**
**Poison sumac, 2852, 3391.**
**Poitiers** (*pwä-tyā'*), France, town 60 mi. s.w. of Tours; pop. 42,000; old churches, Rom. remains; Charles Martel defeated Moors near by (732); victory of Black Prince over French (1356), **1700.**
**Poitou** (*pwä-tu'*), old province of w. France; cap. Poitiers; governed by counts in Middle Ages; formed part of territory known as Aquitaine; *map,* **1351;** acquired by Eng. crown, **1633.**
**Pokeberry** or **pokeweed,** a weed having poisonous fruit, **2854.**
**Pola** (*pō'lä*), Italy. Fortified town with one of finest harbors in Europe, on peninsula of Istria on Adriatic Sea; pop. 70,000; interesting Rom. remains; before World War chief naval station of Austria-Hungary.
**Po'land,** republic of n. Europe; 150,000 sq. mi.; pop. about 30,000,000; **2856–9,** *maps,* **2858, 1196–7;** cap. Warsaw, **3673;** chief cities, **2857, 914–5;** government, **2859;** national dress, **271;** products and resources, **2857, 524;** racial characteristics, **3250;** woman suffrage, **3779.** *—History,* **2856, 2859, 1195;** Sobieski, **3559, 2859;** war with Sweden, **698;** the three partitions, **2856, 2147, 2929, 915,** *map,* **2858;** Kosciusko, **1944;** in World War, **3798, 2858, 3812, 3811;** Danzig corridor, **962, 3651;** Paderewski, **2625;** Teschen dispute, **948,** *map,* **947.**
**Poland China hog, 1671.**
**Polar bear, 355.**
**Polar exploration, 2859–64,** *maps,* **189. 144, 120;** Amundsen, **119–21, 2863–4;** Andrée's balloon attempt, **312;** Capt. James Cook, **874;** Dr. Frederick Cook, **2862, 2704;** Franklin, **617;** Greenland, **1540;** Hudson, **1690;** Nansen, **2862;** Peary, **2703–4;** Scott, **3149–50.**
**Polar hare, 1585.**
**Polaris.** Same as **Pole Star.**
**Polar'iscope, 2000;** used to distinguish tartrates, **3438.**
**Polariza'tion,** of light, **2000;** by double refraction, *picture,* **1999.**
**Polar regions,** defined, **1969;** *maps,* **120.** *See also in Index* **Antarctic continent; Arctic regions; Polar exploration.**
**Polder,** land reclaimed by diking, **1827,** *picture,* **1191.**
**Pole, Reginald** (1500–58). Eng. cardinal and archbishop of Canterbury, of whom his friend, Sir Thomas More, said that he was as learned as he was noble and as virtuous as he was learned; opposed divorce of Henry VIII and compelled to leave England; leader in Council of Trent; returned to England on accession of Mary.
**Pole** or **rod,** unit of measure, **3714.**
**Pole, magnetic.** *See in Index* **Magnetic pole.**
**Polecat, 3246.**
**Polen'ta,** an anc. and noble family of Italy; Francesca da Rimini was born a Polenta; **2979.**
**Pole Star** or **Polaris,** star nearest in line above North Pole; located by "Dipper," **239, 3342, 872, 873;** not seen south of equator, **3285.**
**Police, 2865–8;** fingerprint identification, **1247–8;** meharistes, **33;** Royal Northwest Mounted, **2528;** Texas Rangers, **3479.**
**Politian** (*pō-lish'i-ăn*), **Angelo** (1454–94). Ital. scholar and poet; the greatest of his time.
**Political economy.** *See in Index* **Economics.**
**Political parties, 2869–71;** in Canada, **618, 620;** in England, **2869, 694.** *—In U.S.,* **2869–70, 3677;** elections, **1107–8, 2915, 3594;** presidents elected, table, **2913;** spoils system, **776;** vice-presidents elected, table, **3636.** *See also in Index* under names of separate parties.
**Political science,** *Study Outline,* **3990–3.** *See also in Index* **Economics; Government; Law; Sociology.**
**Polk, James Knox** (1795–1849), 11th president, of U.S., **2871–3;** administration, **2872–3;** Buchanan, sec. of state, **522;** home, **2398;** Mexican War, **2207–8, 3444.**
**Polk, Leonidas** (1806–64). Amer. Confederate general, first Prot. Episc. bishop of Louisiana; fought at Shiloh, Stone River, Murfreesboro, Chickamauga; killed while reconnoitering at Marietta, Ga.
**Pol'len,** the fertilizing element of flowers, **1304, 1307–9;** carried by bees, **360, 362–3,** *pictures,* **360, 361;** how distributed for water-plants, **3700;** water-lily, *picture,* **474.**
**Pol'liwogs,** the fish-like young of frogs and their relatives, **1373–4. 3507.**
**Poll tax, 3441;** a cause of Peasant's Revolt in England, **3571.**
**Pollux** (*pŏl'ŭks*). Twin of Castor. *See in Index* **Castor and Pollux.**
**Pollux,** a star, **657, 3342;** where located, *charts,* **873, 3343.**
**Po'lo, Maffeo, 2874.**
**Polo, Marco** (1254?–1324), Venetian traveler, **2874;** tales of Kublai Khan, **2285;** first reports about Japan, **1869;** visits Sumatra, **3391.**
**Polo, Niccolo, 2874.**
**Polo,** a game played on horseback, **2873.**
**Polonius** (*pō-lō'nĭ-ŭs*), in Shakespeare's 'Hamlet', vain, garrulous old chamberlain, father of Ophelia; "full of wise saws and modern instances"; slain by Hamlet, **1570.**
**Poltava** (*pŏl-tä'vä*), Russia, also **Pultova** or **Pultowa,** in Ukraine 200 mi. s.e. of Kief; pop. 82,000; trade in cattle, grain; battle of, **698, 896, 3404.**
**Polyan'dry,** form of marriage, **1224.**
**Polyan'tha rose,** *picture,* **3067.**
**Polybius** (*pō-lĭb'i-ŭs*) (204?–125 B.C), Gk. historian of growth of Rom. power, **1538.**
**Polycarp** (*pŏl'i-kärp*) (69?–155?), Christian martyr, bishop of Smyrna; called on to revile Christ, replied, "Eighty and six years have I served Him and He hath done me no wrong. How can I revile my Lord and Savior?" Burned by mob, **3255.**
**Polyclitus** (*pŏl-i-klī'tŭs*) (5th cent. B.C.), Gk. sculptor; 'Doryphorus' or Spear-Bearer, described, **1530;** statue of Hera, **1639.**
**Polydec'tes,** in Gk. myth., king who sent Perseus to kill Medusa, **2731;** turned to stone, **2732.**
**Polyg'amy** (*pō-lĭg'ă-mi*), form of marriage, **1224;** in Mohammedanism, **2276, 3558, 3559;** in Mormon church, **2327, 3612, 223.**
**Polygno'tus,** Gk. painter of 4th cent., **1529.**
**Polygonaceae** (*pŏl-i-gō-nā'sē-ē*). the dock family of plants, **3940.**
**Polyhymnia** (*pŏl-i-him'ni-ă*), in Gk. myth., Muse of hymns, **2373,** *picture,* **156.**
**Polynesia** (*pŏl-i-nē'shi-ă*), a division of the Pacific isls., in a belt chiefly within 30 degrees on each side of the Equator, **2620–3,** *map,* **2624–5.**
**Polynesians.** *See in Index* **Malays.**
**Polynices** (*pŏl-i-nī'sēz*), in Gk. myth., son of Oedipus and brother of Antigone, **2566.**
**Polyno'mial,** in algebra, **95, 96.**
**Polyp** (*pŏl'ip*), coral, **886;** evolutionary position, **128;** of jelly-fish, **1884;** sea-anemone, **3164.**
**Polypet'alous plants,** a division of the angiosperms, **3533, 3939.**
**Polyphemus** (*pŏl-i-fē'mŭs*), in the 'Odyssey', Cyclops from whom Odysseus escaped by putting out his eye; legend, **944–5.**
**Polyphon'ic music, 2378.**
**Pol'ytheism** ("many gods"), **1105.**
**Pombal** (*pŏm-bäl'*), **Sebastian Joseph de Carvalho e Mello, Marquis of** (1699–1782). Premier of Portugal under King Joseph, called the "Great Marquis"; expelled Jesuits, rebuilt Lisbon after great earthquake 1775, reorganized army, education, and freed Indian slaves in Brazil.
**Pome'granate,** tree of myrtle family, **2874–5;** grown in Nevada, **2444.**
**Pomegranate melon, 2196.**
**Pom'elo,** or grapefruit, **1499–1500.**
**Pomera'nia,** an agricultural province of Prussia on Baltic Sea; 11,654 sq. mi.; pop. 1,790,000; Oder R.; sea trade of which Stettin (cap.) is center; farm products, **1140.**
**Pomeranian dog, 1023,** *picture,* **1018.**
**Pomo'na,** Rom. goddess of fruit, **1566.**
**Pomona,** another name for **Mainland,** largest of Orkney Isls., **2601.**
**Pomona,** Calif. Beautiful city and health resort, 30 mi. e. of Los Angeles; pop. 13,505; fruit-growing region, noted for oranges and lemons.
**Pomona College.** At Claremont, Calif.; co-ed.; founded 1887; classics, literature, sciencc.
**Pompadour** (*pôn-pä-dur'*), **Jeanne Antoinette Poisson, Marquise de** (1721–64), favorite and powerful political adviser of Louis XV of France, **3180.**
**Pom'pano,** a food fish, **1279.**
**Pompeii** (*pŏm-pā'yē*), Italy, anc. Rom. city destroyed by an eruption of Mt. Vesuvius 79 A.D., **2875–8;** soap, **3263.**
**Pom'pey the Great** (106–48 B.C.), Rom. general and statesman, **2878;** and Caesar, **564;** takes Jerusalem, **1891.**
**Pompey's Pillar,** Alexandria, *picture,* **88.**
**Ponce** (*pōn'thā*), 2d city of Porto Rico, 3 mi. from s. coast; pop. 42,000; tobacco mfrs.; exports coffee and sugar from port at Playa dc Ponce; coffee industry, **2886.**

**Ponce de Leon** (*pōn'thā dā lā-ōn'*), **Juan** (1460?–1521), Span. explorer, discoverer of Florida, **2878, 1295,** *map,* **1296–7;** in Porto Rico, **2887.**
**Pondicherry** (*pŏn-dĭ-shĕr'ĭ*), Fr. settlement in s.e. on Coromandel coast of India, dating from 17th cent. and still cap. of few remaining Fr. possessions in India proper; pop. 47,000; several times taken by English; **1756.**
**Pond-lily.** *See in Index* **Water-lily.**
**Pond-scum,** a massed green alga (*Spirogyra*), **92.**
**Pondweeds, 3700.**
**Pongee' silk, 3237, 3195.**
**Poniatowski** (*pō-nē-ä-tŏv'skĭ*), **Joseph Anthony** (1763–1813). Polish prince, commander under Napoleon, and marshal of France; died fighting to cover Fr. retreat after Leipzig; burial place, **914.**
**Ponta Delgada** (*pôn'tä dĕl-gä'dä*), town on St. Michaels Isl., Azores; pop. 17,000; **288.**
**Pontchartrain** (*pôn-shär-trăn'*), salt water lake in s.e. Louisiana; length 36 mi., greatest width 22 mi.; *map,* **2070;** New Orleans canal, **2468.**
**Pont de Bordeaux, 466.**
**Pon'tiac** (1720?–69), Ottawa Indian chief, organizer of "conspiracy of Pontiac" (1763–65) against British, **1772, 2226.**
**Pontiac,** Mich. Industrial city on Clinton R. 25 mi. n.w. of Detroit, in lake region with good hunting and fishing; pop. 34,273; trade in farm produce, wool, fruit; automobiles and accessories, farm implements, lumber products.
**Pon'tifex Max'imus, 2664.**
**Pontine marshes,** a swampy region in w.-cent. Italy, near Rome; malaria, **1838.**
**Pontius Pilate.** *See in Index* **Pilate.**
**Pontoon',** of seaplanes, **60,** *picture,* **63.**
**Pontoon bridge, 506.**
**Pon'tus,** anc. region in n.e. Asia Minor on Black Sea; originally part of Cappadocia; kingdom founded 4th cent. B.C.; subdued by Pompey, **2878.**
**Pony, Shetland, 1685,** *picture,* **1684.**
**Pony Express,** early overland mail route in U.S., **528.**
**Pony fur, 1390.**
**Pool,** or "pocket billiards," **393.**
**Poo'na** or **Puna,** India. Agricultural trade center 75 mi. s.e. of Bombay; healthful climate; pop. 159,000; summer seat of Bombay govt.
**Poor Clares,** Rom. Cath. religious order for women, **1355.**
**Poor-laws, 2878–9.**
**'Poor Richard's Almanac', 1357, 111.**
**Popcorn, 890.**
**Pope, Alexander** (1688–1744), Eng. poet, **2879, 1043,** *picture,* **1165;** birthplace, **2052;** master of satire and criticism, **1165.**
**Pope, John** (1822–92), Amer. Civil War general; commanded Federal Army of Virginia in 2d battle of Bull Run; resigned after defeat; **1984, 2095.**
**Pope,** election, **2666, 643;** infallibility, **764, 2814;** origin of office, **2664–5, 763, 2745;** primacy, **2665, 2666.** *See also in Index* **Papacy** and individual popes by name.

### POPES OF THE ROMAN CATHOLIC CHURCH (FROM GREGORY I)

NOTE: The dates found in this list are those given by the 'Catholic Encyclopedia'. Names of antipopes are in brackets, thus [ ].

590-604 Gregory I, the Great
604-606? Sabinianus
607 Boniface III
608-615 Boniface IV
615-618 Deusdeit
619-625 Boniface V
625-638 Honorius I
638-640 Severinus
640-642 John IV
642-649 Theodore I
649-655 Martin I
654-657 Eugenius I
657-672 Vitalianus
672-676 Adeodatus
676-678 Donus
678-681 Agathon
682-683 Leo II
684-685 Benedict II
685-686 John V
686-687 Conon
687-701 Sergius I
701-705 John VI
705-707 John VII
708 Sisinnius
708-715 Constantine
715-731 Gregory II
731-741 Gregory III
741-752 Zacharias
752 Stephen
752-757 Stephen II
757-767 Paul I
[767-768 Constantine]
768-772 Stephen III
772-795 Adrian I
795-816 Leo III
816-817 Stephen IV
817-824 Paschal I
824-827 Eugenius II
827 Valentine
827-844 Gregory IV
844-847 Sergius II
847-855 Leo IV
[855 Anastasius]
855-858 Benedict III
858-867 Nicholas I
867-872 Adrian II
872-882 John VIII
882-884 Marinus I
884-885 Adrian III
885-891 Stephen V
891-896 Formosus
896 Boniface VI
896-897 Stephen VI
897 Romanus
897 Theodore II
898-900 John IX
900-903 Benedict IV
903 Leo V
903-904 Christopher
904-911 Sergius III
911-913 Anastasius III
913-914 Lando
914-928 John X
928 Leo VI
928-931 Stephen VII
931-936 John XI
936-939 Leo VII
939-942 Stephen VIII
942-946 Marinus II
946-955 Agapetus II
955-964 John XII
963-965 Leo VIII
964 Benedict V
965-972 John XIII
973-974 Benedict VI
[974 Boniface VII]
974-983 Benedict VII
983-984 John XIV
984-985 Boniface VII
985-996 John XV
996-999 Gregory V
[997-998 John XVI]
999-1003 Sylvester II
1003 John XVII
1003-09 John XVIII
1009-12 Sergius IV
1012-24 Benedict VIII
1024-32 John XIX
1032-45 Benedict IX
[1045 Sylvester III]
1045-46 Gregory VI
1046-47 Clement II
[1047-48 Benedict IX]
1048 Damasus II
1049-1054 Leo IX
1055-57 Victor II
1057-58 Stephen IX
1058-59 Benedict X
1059-61 Nicholas II
1061-73 Alexander II
[1061-64 Honorius II]
1073-85 Gregory VII
[1084-1100 Clement III]
1087 Victor III
1088-99 Urban II
1099-1118 Paschal II
[1105-11 Sylvester IV]
1118-19 Gelasius II
[1118-21 Gregory VIII]
1119-24 Calixtus II
1124-30 Honorius II
[1124 Celestine II]
1130-43 Innocent II
[1130-38 Anacletus II]
[1138 Victor IV]
1143-44 Celestine II
1144-45 Lucius II
1145-53 Eugenius III
1153-54 Anastasius IV
1154-59 Adrian IV
1159-81 Alexander III
[1159-64 Victor IV]
[1164-68 Paschal III]
[1168-78 Calixtus III]
[1179-80 Innocent III]
1181-85 Lucius III
1185-87 Urban III
1187 Gregory VIII
1187-91 Clement III
1191-98 Celestine III
1198-1216 Innocent III
1216-27 Honorius III
1227-41 Gregory IX
1241 Celestine IV
1243-54 Innocent IV
1254-61 Alexander IV
1261-64 Urban IV
1265-68 Clement IV
1271-76 Gregory X
1276 Innocent V
1276 Adrian V
1276-77 John XXI
1277-80 Nicholas III
1281-85 Martin IV
1285-87 Honorius IV
1288-92 Nicholas IV
1294 Celestine V
1294-1303 Boniface VIII
1303-04 Benedict XI
1305-14 Clement V
1316-34 John XXII
[1328-30 Nicholas V]
1334-42 Benedict XII
1342-52 Clement VI
1352-62 Innocent VI
1362-70 Urban V
1370-78 Gregory XI
1378-89 Urban VI
1389-1404 Boniface IX
[1378-94 Clement VII]
[1394-1424 Benedict XIII]
1404-06 Innocent VII
1406-15 Gregory XII
1409-10 Alexander V
1410-15 John XXIII
1417-31 Martin V
[1424 Benedict XIV]
[1424-29 Clement VIII]
1431-47 Eugenius IV
[1439-49 Felix V]
1447-55 Nicholas V
1455-58 Calixtus III
1458-64 Pius II
1464-71 Paul II
1471-84 Sixtus IV
1484-92 Innocent VIII
1492-1503 Alexander VI
1503 Pius III
1503-13 Julius II
1513-21 Leo X
1522-23 Adrian VI
1523-34 Clement VII
1534-49 Paul III
1550-55 Julius III
1555 Marcellus II
1555-59 Paul IV
1559-65 Pius IV
1566-72 Pius V
1572-85 Gregory XIII
1585-90 Sixtus V
1590 Urban VII
1590-91 Gregory XIV
1591 Innocent IX
1592-1605 Clement VIII
1605 Leo XI
1605-21 Paul V
1621-23 Gregory XV
1623-44 Urban VIII
1644-55 Innocent X
1655-67 Alexander VII
1667-69 Clement IX
1670-76 Clement X
1676-89 Innocent XI
1689-91 Alexander VIII
1691-1700 Innocent XII
1700-21 Clement XI
1721-24 Innocent XIII

1724-30 Benedict XIII
1730-40 Clement XII
1740-58 Benedict XIV
1758-69 Clement XIII
1769-74 Clement XIV
1775-99 Pius VI
1800-23 Pius VII
1823-29 Leo XII
1829-30 Pius VIII
1831-46 Gregory XVI
1846-78 Pius IX
1878-1903 Leo XIII
1903-14 Pius X
1914-22 Benedict XV
1922- Pius XI

**"Pop Goes the Weasel,"** folk-dance, *picture,* **1317.**

**Popish Plot.** Between 1678 and 1680 Titus Oates made repeated efforts to prove by false testimony and forged papers that the Queen and some of the leading Eng. Catholics were plotting to murder Charles II and restore Catholicism as the state religion; popular feeling ran high; a number of Jesuits and other Catholics were executed.

**Pop'lar,** a genus of trees, **2879–80, 2828;** autumn coloration, **3537;** classified, **3533;** seeds, **3534;** name applied to tulip trees, **3548.**

**Pop'lin.** A fabric with a warp of silk and a heavier filling of worsted, cotton, or linen, which gives the material a corded surface; name comes from "Pope," for the fabric was first manufactured at Avignon, the papal residence in the 14th cent.

**Popocatepetl** (*pō-pō-kä-tä'pĕt-l*), **Mt.,** volcano about 40 mi. s.e. of Mexico City; one of highest peaks in N. Amer. (17,782 ft.); crater yields sulphur; violent eruptions 1921; **2209, 2218,** *picture,* **2212.**

**Poppaea Sabina** (*pŏp-ē'ȧ sȧ-bī'nȧ*) (d. 65 A.D.), wife of Nero, **2436.**

**Popping crease,** in cricket, **919.**

**Poppy, 2880,** *picture,* **2585;** opium poppy, **2584–5.**

**Popular** or **Squatter Sovereignty,** in Amer. history, doctrine that inhabitants of a territory had right to regulate their internal affairs without interference by national govt.; Douglas supports, **1027, 2017;** Kansas-Nebraska Bill, **1913.**

**Population, 2880–1,** *maps,* (Africa) **40–1,** (Asia) **232–3,** (Australia) **264–5,** (Europe) **1190–1,** (N. Amer.) **2514–5,** (S. Amer.) **3288–9;** census, **676–8;** expansion of white race, **2956–7;** influenced by geography, **2790;** of U.S., **3579, 3580, 3587, 3591–2.** For population of continents and other political divisions *see in Index* **Africa; Asia;** etc.

**Populist party,** in U.S., **791, 2871.**

**Poquelin** (*pŏk-lăn'*), **Jean-Baptiste,** real name of Molière, **2279.**

**Porcelain** (*pôrs'lĭn*) **and chinaware, 2881–3;** Chinese, **2881,** *pictures,* **2881, 2882, 1146;** Copenhagen ware, **996;** Dresden, **2883, 1041,** *pictures,* **2882;** gate of Teheran, *picture,* **2736;** Japanese, **1874, 2883;** Sèvres, **2883, 2685;** Trenton, **3540.** *See also in Index* **Pottery.**

**Por'cupine,** a rodent with quill-like spines, **2883–4, 3036.**

**Pore.** Minute opening in the skin through which gland secretions reach the surface.

**Porif'era,** the sponge group of animals, **3330, 3944.**

**Pork,** meat of the hog, **1670, 1671;** dressing and packing, **2181;** food value, **1321;** use prohibited by certain religions, **2276.**

**Porkop'olis,** nickname for Cincinnati, Ohio, **766.**

**Pork tapeworm, 3813.**

**Porphyry** (*pôr'fĭ-rĭ*), an igneous rock, **1972.**

**Porpoise** (*pôr'pŏs*), a marine mammal, **2884;** distinguished from dolphin, **1026–7;** evolutionary position, **128.**

**Por'sena, Lars,** in Rom. legends, king of Clusium and Etruria, **3494, 3042.**

**Porson, Richard** (1759–1808). One of the greatest Eng. classical scholars of all times; notes and emendations on Aeschylus, Aristophanes, and other Gk. authors.

**Port,** wine, origin of name, **2888.**

**Portage** (*pōrt'ăj*), Wis., mfg. city 35 mi. n. of Madison on canal connecting Wisconsin and Fox rivers; pop. 5582; **3768.**

**Portage La Prairie,** Manitoba. Railroad and distributing center about 55 mi. w. of Winnipeg in rich wheat section; pop. 6000; various mfrs.

**Portal vein, 2031.**

**Port Arthur,** strongly fortified naval station in Chinese Manchuria; pop. 17,000; terminus of S. Manchurian r.r; **2135, 3098, 1870.**

**Port Arthur,** Ontario, city at head of L. Superior, grain and coal-shipping center of w. Canada; pop. 20,000; **1333;** grain elevator, **1492,** *picture,* **604;** lake commerce, **1513.**

**Port Arthur,** Tex. Trade center and seaport in extreme s.w. of state on Sabine L., connected with Gulf of Mexico by Port Arthur Ship Canal; pop. 22,251; oil-refining center.

**Port Augusta,** S. Australia, seaport on Spencer Gulf; railroad, **264.**

**Port au Prince** (*pōrt ō prăns*), cap. and principal seaport of Haiti, W. Indies, on w. coast; pop. 120,000; **1560,** *picture,* **1561.**

**Port Chester,** N.Y. Village and summer resort on Long Island Sound, 26 mi. n.e. of New York City; pop. 16,573; screws and bolts, shirts, candy.

**Port Colborne,** Ontario, town and port on L. Erie, **3716.**

**Portcul'lis, 656.**

**Port Dalhousie,** Ontario, town and port on L. Ontario, **3716.**

**Porte.** *See in Index* **Sublime Porte.**

**Port Elizabeth.** The 2d city of Cape of Good Hope Province, S. Africa, seaport 400 mi. e. of Cape Town; pop. 24,000; large trade.

**Porter, David** (1780–1843). Amer. naval officer in war with Tripoli (1801–03) and War of 1812; commander of Mex. naval forces 1826–29; father of David Dixon.

**Porter, David Dixon** (1813–91), Amer. naval officer, **2884.**

**Porter, Eleanor H.** (1868–1920). Amer. author, b. Littleton, N.H. ('Pollyanna', one of most popular of the "glad books").

**Porter, Gene Stratton** (born 1868). Amer. author and ornithologist, b. Wabash County, Ind. ('A Girl of the Limberlost').

**Porter, Jane** (1776–1850). Eng. novelist ('Thaddeus of Warsaw'; 'Scottish Chiefs').

**Porter, Noah** (1811–92). Amer. educator; pres. Yale Univ. (1871–76); editor of Webster's and other dictionaries ('The Human Intellect'; 'Books and Reading').

**Porter, William Sydney** ("O. Henry") (1862–1910), Amer. short-story writer, **2884–5.**

**Porterhouse,** a cut of beef, **2185.**

**Port Florence,** British East Africa, port on Victoria Nyanza, **3641.**

**Port Gibson,** Miss. Town 30 mi. s. w. of Vicksburg; here Admiral D. D. Porter ran the Vicksburg batteries April 16, 1863, and General Grant defeated the Confederates May 1, 1863.

**Porthos** (*pōr-tōs'*), one of the "Three Musketeers" of Dumas' novel; noted for size, strength, and fondness for display; **1048.**

**Port Hudson,** La. Village 18 mi. above Baton Rouge on Mississippi R.; captured by Union forces under General Banks July 9, 1863.

**Port Huron,** Mich. Port on St. Clair and Black rivers at foot of L. Huron; pop. 25,944; extensive Canadian trade; connected with Sarnia, Ontario, by r.r. tunnel; ships, knit goods; summer resort.

**Portia** (*pôr'shĭ-ȧ*), heroine of Shakespeare's 'Merchant of Venice', **2199.**

**Port Jervis,** N.Y. A r.r. center and summer resort on Delaware R. 60 mi. n.w. of New York City, at junction of N.Y., N.J., and Pa. boundaries; pop. 10,171; r.r. shops; gloves, glass, silk.

**Portland,** Me., largest city and chief seaport in state on Casco Bay 50 mi. s.w. of Augusta; pop. 69,272; shoes, ships, machinery, lumber products, fish; burned by British 1775; **2128;** great fire, **1262.**

**Portland,** Ore., largest city of state; pop. 258,288; **2885,** *pictures,* **2597.**

**Portland, Isle of,** peninsula on coast of Dorsetshire, England; noted for building-stone, **674.**

**Portland cement, 674–6.**

**Portland vase,** beautiful dark blue glass urn with figures in white; found in tomb near Rome; broken by a madman in 1845 but skilfully repaired; now in British Museum; *picture,* **1206.**

**Port Louis,** cap. of Mauritius; pop. 41,000; **2175.**

**Port Mahon** (*mä-hōn'*), seaport and cap. of Minorca, one of Balearic Isls., **307.**

**Port Natal'.** *See in Index* **Durban.**

**Port Nelson,** Manitoba, town at mouth of Nelson R. on Hudson Bay; Hudson Bay r.r., **603.**

**Port Newark Terminal, 2448.**

**Porto Alegre** (*pōr'tō ä-lā'grā*). Port and cap. of state of Rio Grande do Sul, Brazil, near n. extremity of L. Patos in agricultural and grazing country; pop. 151,000; Ger. colony handled most of commerce before World War.

**Porto Bel'lo.** Port on Atlantic coast of Isthmus of Panama 20 mi. n.e. of Colon; long the shipping point for Spanish treasure from Peru.

**Port of entry.** Any point, whether on the frontier or not, designated by the customs authorities as a place where merchandise or persons may enter or pass out of a country.

**Port of Spain,** cap. of Trinidad; pop. 70,000; **3541.**

**Porto Grande** (*grän'dā*), seaport, Cape Verde Isls., **641.**

**Porto Rico** (*rē'kō*), isl. of W. Indies, ceded to U.S. by Spain in 1898; 3600 sq. mi.; pop. 1,300,000; cap. San Juan; **2885–7,** *map,* **2514–5;** acquired by U.S., **3307;** coffee, **824;** earthquake of 1919, **1066;** government, **2887, 3599;** industries and products, **2885–6.**

**Porto San'to,** mountainous isl. of Madeiras; about 20 sq. mi.; **2106.**

**Port Republic,** Va. Village on Shenandoah R. 90 mi. n.w. of Richmond; here Confederates under "Stonewall" Jackson defeated Federals under Gen. Shields June 9, 1862.

**Port Royal,** Nova Scotia, former name of Annapolis; founded, **687, 2538.**

**Port Royal,** S.C., first settlement in S.C., **3292.**

**Port Said** (*sä-ēd'*), Egypt, at n. end of Suez Canal; pop. (with Ismailia) 91,000; founded as coaling station 1859; exports cotton; attempt of Turks during World War to capture city and wreck canal failed: **3384, 2645.**

**Portsmouth** (*pôrts'mŭth*), England, great Eng. naval station and arsenal, 74 mi. s.w. of London; pop. 230,000; **2887.**

**Portsmouth,** N.H., seaport, resort, and mfg. city on Piscataqua R. 3 mi. from Atlantic; pop. 13,569; large button factory; coal shipping center; **2454.**

**Portsmouth,** Ohio. City on Ohio and Scioto rivers, and at s. end of Ohio Canal; pop. 33,011; agricultural and mining region; steel and iron products, knit goods, shoes, lumber, stoves.
**Portsmouth,** Va., twin city of Norfolk; pop. 54,387; at mouth of James R.; Norfolk Navy Yard; **2513.**
**Portsmouth, Treaty of** (1905), **3098.**
**Port Stanley,** Ontario, village and harbor on L. Erie, 23 mi s. of London, **2057.**
**Por'tugal,** republic of s.w. Europe; 35,490 sq. mi.; pop. 5,600,000; **2888–91,** *maps,* **1196–7, 3300;** Azores, **288;** cap. Lisbon, **2026;** colonial possessions, **641, 1069, 40, 1756;** cork, **887–8;** education, **2889;** elevation, *map,* **1190–1;** government, **2891;** language and literature, **2889–90, 3040;** Madeira, **2106;** population, **2889,** *map,* **1190–1;** products and resources, **2888–9;** rainfall, **2888,** *map,* **1190–1;** vegetation, *map,* **1190–1.** —*History,* **2888, 2890–1;** African explorations, **36, 640, 858, 3279;** Brazil, **496;** Far East, **685, 1072, 1869, 1879, 2131;** Henry the Navigator, **1638–9;** Vasco da Gama, **1392–3;** revolution of 1910, **2026.**
**Portuguese East Africa.** *See in Index* **Mozambique.**
**Portuguese Guinea,** colony on w. coast of Africa enclosed on land side by Fr. territory; includes adjacent Bissagos Isls.; 13,940 sq. mi.; pop. 289,000; chief port Bissao; *map,* **40–1.**
**Portuguese language and literature, 2889–90, 3040.**
**Portuguese man-of-war,** a jelly-fish, **1884.**
**Portuguese West Africa.** *See in Index* **Angola.**
**Poseidon** (*pō-sī'dŏn*), in Gk. myth., god of the sea, **2891;** and Athena, **249;** Cretan bull, **1640;** Cassiopeia, **2732;** Odysseus, **944–5, 2563.**
**Po'sen** (Polish *Poznan*), former Prussian province; 11,186 sq. mi.; cap. Posen; ceded to Poland, **3811.**
**Posen,** Poland, r.r. center, 170 mi. s. of Warsaw on Warthe R.; pop. 157,000; important medieval trade center; held by Prussia 1793–1918 and heavily fortified; industries, **2857.**
**Positive,** in motion picture photography, **2350,** *picture,* **2354.**
**Positive electricity, 1110.**
**Pos'itivism.** System of philosophy founded by Auguste Comte, which assumed to organize all knowledge so as to form a basis for a science of society and a religion of humanity; rejected all metaphysical inquiry.
**Post,** size of paper, **2673.**
**Postage, rates of, 2896, 2898, 2894, 3337.**
**Postage stamps, 3337;** first used, **2896, 2898;** gum used on, **3344;** printing of, *picture,* **3599;** special delivery, **2893.**
**Postal savings bank, 2894, 329.**
**Postal Union, International, 2898.**
**Postern** (*pōs'tērn*) **gate, 656,** *picture,* **655.**
**Post-impressionism,** in painting, **2633–4;** in sculpture, **3164.**
**Postoffice, 2892–8;** African postman, *picture,* **34;** pneumatic tube carriers, **2847;** stamps, **3337.**
**Postoffice Department,** U.S., **3597, 3599, 2893–4, 2898.**
**Pot'ash** or **potassium carbonate, 2900, 2898–9, 10;** in Alsace, **103;** caustic potash (potassium hydroxide), **2900, 10;** as fertilizer, **1235;** from beet sugar wastes, **3388, 2430;** German deposits, **1443;** Nebraska industry, **2430;** from seaweed, **3171.**
**Potash feldspar, 1230.**
**Potas'sium,** a metallic element, **2898–2900, 4042;** in alkali, **10;** in alum, **104;** in baking powder, **305, 3438;** caustic potash (potassium hydroxide), **10;** comparative abundance on earth, **711,** *picture,* **1058;** cyanide poisonous, **2855;** cyanide used in gold extraction, **944, 1480;** in glass-making, **10;** needed by plants, **1235,** *picture,* **2821;** nitrate used in gunpowder, **1552–3;** in protoplasm, **394;** resembles sodium, **3272;** salts used in soapmaking, **3263;** in tartrates, **3438, 305.** —*Compounds:* bitartrate, **305;** chlorate, **2170;** cyanide, **944, 1480, 2855;** hydroxide, **2900, 10;** orthophosphate, **305;** nitrate (saltpeter), **2900, 3118, 1552–3;** permanganate, **435;** sulphate, **2900, 10.** *See also in Index* **Potash.**
**Pota'to, 2900–2;** Burbank, **538;** in France, **1346;** in Germany, **1440;** Ireland, **1807;** Maine, **2126;** ravages of potato-bug, **2902;** starch, **3344;** structure of tuber, **532,** *picture,* **2408;** vitamins, **3652;** weight of bushel, **3715;** when and how to plant, **1397, 2901.**
**Potato, sweet, 3405–6, 2902;** food value, **1322;** when and how to plant, **1397.**
**Potato-bug, 2902;** rate of increase, **401.**
**Potato spoon race,** game, **2836–7.**
**Potato starch, 3344.**
**Potawat'omies,** Indian tribe of Algonquian group; originally dwelt about Green Bay; moved to upper Wabash R. and w. into Illinois, **1765–6.**
**Poten'tial,** electric voltage or "pressure," **1110, 1116.**
**Po'ti,** seaport of Transcaucasia in republic of Georgia on Black Sea, 35 mi. n. of Batum; pop. 21,000; unhealthy climate; commerce, **664.**
**Potiphar** (*pŏt'ĭ-fär*). An Egypt. official, whose wife tempted Joseph, his slave (Gen. xxxix, 1).
**Potlatch,** Idaho, town in n. near w. border on Palouse R.; pop. 2103; lumber mill, **1727,** *picture,* **1728.**
**Potomac** (*pō-tō'măk*), a r. of e. U.S., flowing 450 mi. into Chesapeake Bay, **2902, 3684, 3685,** *map,* **2162;** early route to west, **3581, 3582;** Great Falls, *picture,* **2163;** supplies Chesapeake and Ohio Canal, **626.**
**Potomac, Army of the,** the principal Federal army in Amer. Civil War; McClellan organizes, **2094–5;** Meade heads, **2179;** Grant takes command, **1498;** Lincoln and generals of, *picture,* **2015;** Sheridan commands cavalry, **3204, 3205.**
**Potomac Park,** Washington, D.C., **3684.**
**Potosí** (*pō-tō-sē'*), silver and tin-mining city of Bolivia on n. slope of Cerro de Potosí, 47 mi. s.w. of Sucre (14,350 ft.); pop. 30,000; **449, 3242.**
**Potsdam,** Germany, historic city, garrison post, and cap. of province of Brandenburg on Havel R. 16 mi. s.w. of Berlin; pop. 59,000; observatory, **2552;** palace, *picture,* **1442.**
**Potter, Paul** (1625–54). Foremost Dutch animal painter and etcher; rendered his subjects with remarkable fidelity of drawing and modeling and with clear, true color.
**Potteries, The.** Name given to dist. of n. Staffordshire, England, chief seat of china and earthenware industry; includes several towns, united in 1910 as one municipal borough (Stoke-on-Trent).
**Pottery, 2903–7;** Aegean, **29,** *pictures,* **28;** Borghese vase, *picture,* **1203;** Chinese, **2881,** *pictures,* **2882;** clay, **783–5, 2903;** anc. Egyptian, **1097, 1100;** factor in civilization, **771,** *pictures,* **772, 3360;** Greek vases, **1529,** *picture,* **1526;** N. Amer. Indian, *pictures,* **1765, 1769;** Japanese, **1874, 2387;** porcelain and chinaware, **2881–3;** purple of Cassius, **1482;** Stone Age bowl, **3360;** in U.S., **2903, 2570, 3540, 766,** *picture,* **2906.**
**Pottstown,** Pa. Industrial borough on Schuylkill R. 35 mi. n.w. of Philadelphia; pop. 17,431; agricultural region; iron and steel products, silk, knitted goods, rubber; Hill School for boys.
**Pottsville,** Pa. Important coal-mining and shipping city on Schuylkill R. 75 mi. n.w. of Philadelphia; pop. 21,876; iron and steel products, underwear, hosiery, silks.
**Poughkeepsie** (*pō-kĭp'sĭ*), N.Y., port on Hudson R. 70 mi. above New York City; pop. 35,000; various mfrs.; base for Continental armies during Rev. War; Federal Constitution ratified here (1788); several preparatory schools; Vassar College, *picture,* **2485.**
**Poultry, 2908–11;** breeding and incubation, **2909–10;** duck, **1046;** egg production, **2908–9, 408;** food value of chicken compared with milk, **2238;** how to pick a good hen, *picture,* **2910;** goose, **1487–8,** guinea fowl, **1547–8;** importance of industry, **2908;** turkeys, **3556;** varieties of chickens, **2910–1, 1210,** *pictures,* **2909;** U.S. production, **3586.**
**Pound, Ezra Loomis** (born 1885). Amer. poet and critic, b. Hailey, Idaho, lives in London ('Canzoni'; 'Exultations'; 'Cathay'; translations of Japanese and Chinese drama and poetry); one of the leading exponents of "free verse."
**Pound,** a unit of weight, **3714, 3715.**
**Poussin** (*pŭ-săn'*), **Nicholas** (1594?–1665), Fr. painter, originator of Fr. classical style, **1202.**
**Pouter pigeons, 2804,** *picture,* **2805;** courtship antics, **405.**
**Powder,** gunpowder, **1552–3, 1211, 1212;** smokeless, **1212.**
**Powderly, Terence Vincent** (born 1849). Amer. labor leader, general master-workman of the Knights of Labor 1879–93; b. Carbondale, Pa.
**Powder River,** in n.e. Wyoming and Montana; 400 mi. to the Yellowstone; *map,* **3820.**
**Pow'ell, John Wesley** (1834–1902), Amer. geologist; exploration of Grand Canyon, **1497.**
**Powell, Maud** (Mrs. H. Godfrey Turner) (1868–1920). Amer. violinist, b. Peru, Ill.; first American woman to achieve a high reputation as a violinist.
**Power,** generation and transmission of: annual production in U.S., *picture,* **3697;** electric, **1108–16, 1050–2, 1124;** from heat, **1621, 3348–52, 1403–6;** hydraulic, **3694–5, 3554, 1708–10;** pneumatic, **2847;** relative value of horse-power and kilowatt, **1052;** schemes to harness tides, **3498;** steam, **3348–52;** sun the ultimate source, **3392;** volcanoes harnessed in Italy, **3660;** wind, **3749.** *See also in Index* **Electricity; Gas engine; Steam engine; Water-power.**
**Power,** in algebra, the number of times a quantity is taken as a factor; shown by exponents, **95.**
**Power,** in physics, capacity for doing work, **4029;** relative value of horse-power and kilowatt, **1052.**
**Powers, Hiram** (1805–73), Amer. sculptor, b. Woodstock, Vt.; **3164.**
**Powers, Preston,** Amer. sculptor; 'Buffalo Group', *picture,* **3163.**
**Powhatan'** (1550–1618?), chief of Powhatan Indian confederacy in Virginia at time of first Eng. settlement; father of Pocahontas; captures Capt. John Smith, **3253.**
**Poynter** (*poin'tĕr*), **Sir Edward John** (1836–1919), Eng. portrait and historical painter, director of National Gallery, London, 1894–1904; designs for Houses of Parliament, St. Paul's Cathedral; 'Atalanta's Race', *picture,* **247.**
**Poynting, John Henry** (1852–1914), Eng. scientist; how he weighed the earth, **1064.**

**Poyser** (*poy'zĕr*), **Mrs.** In George Eliot's 'Adam Bede', farmer's capable wife, noted for her ready wit.
**Poznan.** *See in Index* **Posen.**
**Pozsony.** *See in Index* **Pressburg.**
**'Praeterita',** Ruskin's autobiography, **3083.**
**Praetorian** (*prĕ-tō'rĭ-ăn*) **Guard.** In Rom. history, imperial body-guard, founded by Augustus, suppressed by Constantine; frequently made and unmade emperors.
**Prae'tors,** Rom. judges, **3044.**
**Pragmat'ic Sanction,** a term applied to several imperial decrees of fundamental importance, especially that of Charles VI (1713), **2147.**
**Prag'matism,** in philosophy, **2773.**
**Prague** (*prāg* or *präg*), cap. of Czecho-Slovakia; pop. 600,000; **2911–2;** battle of (1757), **3180;** famous clock, *picture,* **800;** university of, **832, 447.**
**Prahran** (*prä-răn'*). City in Victoria, Australia, suburb 4 mi. s.e. of Melbourne; pop. 42,000.
**Praia** (*prī'ä*), cap. of Cape Verde Isls.; pop. 21,000; cable station and meteorological observatory; **641.**
**Prairie** (*prā'rĭ*), **2790;** of Africa, **3279;** of Argentina, **191;** of Russia, **3086.** *See also in Index* **Plains.**
**Prairie chicken, 1545;** courtship antics, **405.**
**Prairie-dog, 2912;** altitude range, *picture,* **397;** and rattlesnake, **2978.**
**Prairie du Chien** (*dụ shēn*), city in Wisconsin, 60 mi. s. of LaCrosse on Mississippi R.; pop. 3537; center of agricultural region; founded 1783, until about 1830 it was an important military post.
**Prairie Grove,** Ark. Town 40 mi. n. of Ft. Smith; scene of victory of Union troops over Confederates Dec. 7, 1862, which checked further Confederate advance into Missouri.
**Prairie hare, 1584.**
**Prairie Provinces,** of Canada, **602.**
**Prairie rose,** *picture,* **3067.**
**Prairie schooner, 582,** *pictures,* **584, 3525.**
**Prairie** or **Sucker State, 1730.**
**Prairie View,** Tex., town in s.e.; pop. 500; normal school, **3478.**
**Prairie wolf,** or coyote, **3774.**
**'Praise of Folly',** satire by Erasmus, **2996;** Holbein illustrates, **1672.**
**Praseodymium** (*prā-sĕ-ō-dĭm'ĭ-ŭm*). A metallic element found associated with similar element neodymium.
**Prater** (*prä'tĕr*), park in Vienna, **3641–2.**
**Pratt, Bela L.** (1867–1917). Amer. sculptor, pupil of Saint-Gaudens and Chapu; statues of John Winthrop, Phillips Brooks, Nathan Hale (Yale campus); figures for main entrance of Library of Congress; all his work characterized by exquisite modeling.
**Prawn,** a shrimp-like crustacean, **3225.**
**Praxiteles** (*prăx-ĭt'ĕ-lēz*) (4th cent. B.C.), Gk. sculptor, greatest of his age, **1530;** statue of Hermes, *picture,* **3156.**
**Praying mantis,** an insect, **2137.**
**Preacher-bird,** a vireo, **3647.**
**Preb'le, Edward** (1761–1807), Amer. naval officer; commanded expedition against Tripoli (1803–05); his flagship *Constitution,* **2423.**
**Precession of the equinoxes, 1173, 3343, 1064,** *picture,* **1063;** illustrated by gyroscope, **1556.**
**Precious metals.** Term usually restricted to gold and silver, but sometimes also including platinum and mercury. *See in Index* names of those metals.
**Precious stones.** *See in Index* **Gems.**
**Precipita'tion:** clouds, **809;** dew, **1000;** fog, **1316;** frost, **1375–6;** hail, **1559;** rainfall, **2972–4** snow, **3261–2.** *See also in Index* **Climate; Rain and rainfall.**
**Pred'icate,** in grammar, **1493, 3174.**
**Pre'fect,** Fr. official, **1351.**
**Preferred stock, 3358.**
**Prefixes,** in English, **1162.**
**Prehistoric Age, 1654, 1655, 771–3.** *See also in Index* **Civilization; Stone Age.**
**Prehistoric animals.** *See in Index* **Animals, prehistoric.**
**'Prelude, The',** poem by Wordsworth, **3788.**
**Pre'mium,** in insurance, **1792.**
**Premo'lars** or **bicuspids, 3452,** *picture,* **3453.**
**Premonstraten'sian Monks, 2299.**
**Preposition** (*prĕp-ō-zĭsh'ŏn*), in grammar, **2912–3.**
**Pre-Raphaelites,** group of painters of 19th cent., **2632, 2329;** example of work, *picture,* **2638.**
**Presbyte'rian College.** At Pine Tree Hill, near Halifax, Nova Scotia; men; established 1820; theology; affiliated with Dalhousie Univ.
**Presbyterians, 2994, 2937;** Calvin's influence, **587;** in Scotland, **1941, 3148, 3149;** in Wales, **3665.** Total world membership about 7,720,000.
**Prescott, William** (1726–95), Amer. soldier, organized regiment of Minutemen (1774); at Breed's Hill, **533.**
**Prescott, William H.** (1796–1859), Amer. historian; achieved great results in face of invalidism and partial blindness; **114.**
**Prescott,** Ariz. Industrial and commercial center; pop. 5010; about 85 mi. n. of Phoenix; 5347 feet above sea-level; copper, gold, silver mining; stock-raising, farming.
**Prescott,** Ontario, mfg. town on St. Lawrence R., opposite Ogdensburg, N.Y.; pop. 3500; port, **3108.**
**Preservatives,** for foodstuffs, **151;** formaldehyde injurious, **1332;** salt, **3115.**
**'President',** Amer. frigate; and *Little Belt,* **3670.**
**Presidential electors,** U.S., **2913–4, 3594.**
**President of France, 1351.**
**President of the United States, 2913–4, 3594;** appointments to Naval Academy, **2419,** to Military Academy, **2237;** cabinet, **555;** original method of election, **3594;** relations with Congress, **860, 862, 3595;** table of presidents, **2913;** veto power, **3636.**
**'Presidents' March', 2405.**
**Presid'io** (Span. "fort"). At San Francisco, Calif.; established as Spanish military post 1776; then Mexican fort until 1848; U.S. post 1850; officers' training camp in World War.
**Presque Isle** (*prĕsk ēl*), now Erie, Pa., **2730.**
**Press,** a machine tool, **3516,** *pictures,* **3515, 2577;** hydraulic, **1710,** *picture,* **1709;** pneumatic, **2847.**
**Press, freedom of, 2918, 2497, 393;** Milton's 'Areopagitica', **2242.**
**Pressburg** (*prĕs'bụrĸ*) or **Bratislava,** Czecho-Slovakia, city on Danube R. 35 mi. e. of Vienna; pop. 74,000; cap. of Hungary 1541–1784; varied mfrs.; farm trade; **961;** treaty of, **3574.** *See also in Index* **Treaties.**
**Pressure,** effect on freezing water, **1362;** "electric" (potential or voltage), **1110, 1116;** in gases, **1403;** in gas mains, **1407;** in liquids, **1708, 1710;** liquefies acetylene gas, **8;** of sap in plants, **2826;** steam, in locomotives, **2043;** of water in ocean depths, **2554, 2556, 1014, 3696.**
**Pressure turbines, 3554.**
**Prester John,** king and priest of a mythical land which had no poor, no thieves, no lies, no vices; legends of 12th and 13th cents., **3.**
**Preston, Andrew W.** (born 1846), Amer. merchant, **324.**
**Preston,** England, port 28 mi. n.e. of Liverpool at mouth of Ribble R.; pop. 122,000; also manufactures brass and iron products, ships, beer; exports coal; cotton mfg. center, **1158.**
**Prestonpans',** Scotland. Village on Firth of Forth; victory of Jacobites under Prince Charles Edward over royal army Sept. 21, 1745.
**Pretender,** name applied to son and grandson of James II of England, who claimed Brit. throne, **2914–5;** Jacobite risings, **2914–5, 1428.**
**Preto'ria,** cap. of Transvaal Province and of Union of S. Africa, 32 mi. n.e. of Johannesburg; pop. 60,000; **3527, 3283;** in Boer War, **3027, 447.**
**Pretoria, Treaty of,** ending Boer War (1902), **447.**
**Prevailing westerlies, 3750,** *picture,* **3751;** effect on rainfall, **2973.**
**Prévost d' Exiles** (*prā-vō' dĕks-ēl'*) **Antoine François** (1697–1763) (Abbé Prévost). Fr. monk and novelist ('Manon Lescaut', "one of the greatest novels of the century").
**Priam** (*prī'ăm*), in Gk. myth., king of Troy, **3543, 3544, 1627.**
**Pribilof** (*prē-bĭ-lŏf'*) **Islands,** Alaska, group of isls. in Bering Sea, abounding in fur seals; **74, 3168,** *picture* of seal rookery, **3167.**
**Price, Sterling** (1809–67), Amer. Confederate general, brigadier-general in Mexican War; gov. of Missouri 1853–57; major-general in Civil War; **1498.**
**Prices,** governed by supply and demand, **1077;** and money, **2282;** regulation of transportation rates, **2971, 853.**
**Prickly lettuce,** a compass plant, **855.**
**Prickly pear,** a flat-stemmed cactus and its pear-shaped fruit, **562, 563;** Burbank's thornless, **538,** *picture,* **539.**
**Pride, Thomas** (d. 1658). Parliamentary officer in Eng. Civil War; carried out order (1648) to expel by force Royalist and Presbyterian members from House of Commons ("Pride's Purge").
**'Pride and Prejudice',** novel by Jane Austen, **2540, 1167.**
**Priestley, Joseph** (1733–1804), Eng. chemist, discoverer of oxygen, **2612, 710, 1796.**
**Priests,** in Rom. Cath. church, **763, 764;** in anc. Egypt, **1104;** Hindu, **1651, 1750,** *picture,* **1752;** Jewish, **1890;** Mohammedan, **3560.**
**Primary cell,** cell which generates electric current without previous charging, **1113.**
**Primary colors, 837.**
**Primary elections, 2915;** replace nominating conventions, **2870.**
**Pri'mate,** of English church, **636.**
**Primates** (*prī-mā'tēz*), the order of nailed mammals, including man, **2132, 2134, 3951–2.**
**Prime,** a prayer, **2299, 2300.**
**Prime minister,** in England, **555, 2054;** in Canada, **621.**
**Priming coat,** first coat of paint, **2642.**
**Primogen'iture,** right of eldest son to inheritance; law abolished in Virginia, **1882.**
**Primrose, Dr. Charles,** clergyman in Goldsmith's 'Vicar of Wakefield', **1483–4.**
**Primrose,** a flowering plant, **2915.**
**Primrose, evening, 2417, 1381.**
**Primrose League, 1013.**
**Pri'mus,** a hybrid berry, **2977.**
**'Prince, The',** political treatise by Machiavelli, **1294.**
**Prince Albert,** Saskatchewan, distributing city for farming region on n. Saskatchewan R. 90 mi. n.e. of Saskatoon; pop. 8000; lumber, live stock, and fur interests; packing houses, govt. stockyards; **3128.**
**Prince Edward Island,** the smallest of the Canadian provinces, in Gulf of St. Lawrence; 2184 sq. mi.; pop. 95,000; cap. Charlottetown; **2915.**

**Prince of Wales,** title of heir to Eng. throne, **3664, 1087.**
**Prince of Wales, Cape,** Alaska. Westernmost point of N. Amer. mainland, on Bering Strait; about 50 mi. from Asia.
**Prince of Wales College.** At Charlottetown, Prince Edward Island; co-ed.; provincial control; founded 1860; arts, domestic science.
**Prince of Wales Island,** s.e. Alaska, *map,* **602–3.**
**Prince of Wales Island,** Canadian isl. in Arctic Ocean, *map,* **616.**
**Prince of Wales Island,** Straits Settlements. Same as **Penang.**
**Prince Patrick Island,** uninhabited Canadian isl. of Arctic region, *map,* **602–3.**
**Prince Rupert,** British Columbia, seaport and r.r. terminus on Pacific coast, on an isl. about 35 mi. s. of Alaska; pop. 6500; lumbering, fishing, and mining interests; large dry dock; **513.**
**'Princess Snow-White',** a folk-tale, **1318.**
**Princes Street,** Edinburgh, **1080,** *picture,* **1082.**
**Princeton,** N.J. Borough 44 mi. s.w. of New York City; pop. 5917; first state legislature of N.J. met here Aug. 27, 1776; scene of victory of Washington over British under Cornwallis Jan. 3, 1777; Continental Congress 1783; Princeton Univ.
**Princeton, battle of, 3003.**
**Princeton University,** at Princeton, N.J.; men; non-sect.; chartered as College of New Jersey 1746; opened at Elizabeth 1747; removed to Newark 1748, to Princeton 1754; arts and science, civil and electrical engineering; preceptorial plan of instruction; graduate school; *picture,* **2459;** artificial lake, **829;** Cleveland at, **791–2;** Wilson at, **3744.**
**Principal,** money upon which interest is paid, **2724.**
**Principe** (*prĭn'sē-pā*) **Island.** Small Port isl. in Bight of Biafra w. of Africa.
**'Principia',** treatise by Newton, **2478, 2190.**
**Printing, 2916–8;** beginning in U.S., **2168, 588;** from blocks, **2916, 1168, 1876, 456, 643;** books, **456–63;** on cloth, **804;** color-printing, **1172;** electrotyping, **1125;** engraving, **1168–72;** importance of invention, **1799–1800, 2996;** inks, **1780;** early Korean, **1944;** lithography, **2030, 1170;** newspapers, **2472–5;** paper, **2666–73;** stamps, *picture,* **3599;** stereotyping, **3355;** type, **3572;** typesetting machine, **2019–23, 2303–5;** wall paper, **3665–7.**
**Printing and Engraving, Bureau of,** U.S., **2284, 3598.**
**Printing press,** development, **2916;** cylinder, *pictures,* **459;** Gutenberg's, *picture,* **2917;** rotary, *pictures,* **2917, 3666;** Japanese, **1876,** *picture,* **1875.**
**Prior, Matthew** (1664–1721). Eng. poet and diplomat, best remembered for his light humorous verse.
**Prior,** monastic officer, **2300.**
**Priory,** a monastic house presided over by a prior or prioress, **2299.**
**Pripet** (*prē'pĕt*). River in w. Russia, chiefly in govt. of Minsk; rises in group of lakes and marshes in c. Poland; flows e. and s.e. 400 mi. to Dnieper.
**Priscilla Mullins.** *See in Index* **Mullins.**
**Prism,** effect on light, **3311–14;** in field glass, **3463;** in telescope, **3462.**
**Prism spectroscope, 3314,** *picture,* **3313.**
**Prison reform, 2920, 1611.**
**Prisons and punishments, 2918–20.**
**Prisrend** (*prĭs-rĕnd'*) or **Prizren,** Jugo-Slavia, Serbian town 40 mi. n.w. of Uskup; pop. 22,000; numerous mosques; once Turkish city; taken by Serbs in Balkan Wars, by Bulgarians in World War; many bazaars, active trade.
**Privateer'ing, 2810, 1794;** Sir Francis Drake, **1030–1.**
**Priv'et,** a shrub, **1627.**
**Priv'y council,** England, **555;** judicial powers, **909;** final court of appeal for Canada, **622.**
**Prizren.** Same as **Prisrend.**
**Probation,** in juvenile courts, **1906.**
**Problem-project method** in education, **4048–68.**
**Proboscis** (*prō-bŏs'ĭs*), of bee, *picture,* **359;** of butterfly, magnified, *picture,* **547;** of elephant, **1126;** of sea elephant, **3169.**
**Proboscis monkey, 2292,** *picture,* **2291.**
**Procne** (*prŏk'nē*). Sister of Philomel. *See in Index* **Philomel.**
**Procon'suls,** provincial governors of anc. Rome, **3046.**
**Procrustes** (*prō-krŭs'tēz*) ("the stretcher"). In Gk. legend, robber slain by Theseus; placed guests on a bed and stretched short men and chopped off tall ones to fit; proverbial "bed of Procrustes."
**Procter, Bryan Waller** ("Barry Cornwall") (1787–1874). Eng. poet; friend of Lamb, Keats, Scott, Dickens, Tennyson.
**Procyon** (*prō'sĭ-ŏn*), a star, **3342,** *charts,* **873, 3343.**
**Producer gas, 1407.**
**Production,** in economics, **1076, 1077.**
**Professions.** *See in Index* **Vocational education.**
**Pro'file Mountain,** N.H., the "Great Stone Face," **2453.**
**Profit,** in economics, **1077.**
**Progreso** (*prō-grā'sō*), Mexico, port for Merida, Yucatan, on n.w. coast; exports sisal, **2209.**
**Progressive** or **"Bull Moose" party,** U.S., **3429, 2870, 3062.**
**Prohibition, 2920–1;** in Russia, **3088;** temperance movement, **3465;** work of Frances E. Willard and W.C. T.U., **3737, 3777.**
**Prohibition party,** U.S., **2870, 2920.**
**Projec'tiles,** for cannon, **634, 635, 636;** Galileo discovers path of, **1392;** for small arms, **1254, 1256.**
**Projection,** of maps, **2142–3.**
**Projection apparatus,** lanterns and lenses throwing pictures on a screen; balopticon, **3354;** motion picture projector, **2350,** *picture,* **2353;** stereopticon, **3353–4.**
**Proletariat** (*prō-lĕ-tā'rĭ-ăt*). In modern usage, workingmen as a class.
**Prometheus** (*prō-mē'thūs*), in Gk. myth., hero who championed man and defied Zeus, **2921;** and Pandora, **2663, 2664.**
**'Prometheus Bound',** tragedy by Aeschylus, **2921.**
**Prominences** of sun, **3395.**
**Promised Land,** of the Jews, **1890.**
**'Promised Land, The',** autobiography of Mary Antin, **1740.**
**Promissory note, 2725–6, 328.**
**Pronghorn,** a N. Amer. antelope, **146,** *picture,* **147.**
**Pronoun, 2921–2, 3174.**
**Pronu'cleus,** of cell, **1642,** *pictures,* **1643.**
**Propagan'da, Congregation of the, 2666.**
**Propel'ler,** airplane, **55;** screw, **3212–4;** of torpedo, **3518.**
**Propertius** (*prō-pĕr'shĭ-ŭs*). **Sextus** (50?–15 B.C.), greatest Rom. elegiac poet, **1967.**
**Property tax, 3441, 3442.**
**Proph'et, The,** Indian leader. Same as **Tenskwatawa.**
**"Prophet of Italian Unity," 2178.**
**Prophets,** Hebrew, **2922–3, 1891.**
**Prophet's Town,** Tecumseh's village, near Lafayette, Ind., **3452.**
**Propontis** (*prō-pŏn'tĭs*). *See in Index* **Marmora.**
**Proposition,** in geometry, **1425.**
**Propylaea** (*prŏp-ĭ-lē'ă*), monumental gateway to Acropolis, **11.**
**Proscenium** (*prō-sē'nĭ-ŭm*), in theater, **3484.**
**Proserpina** (*prō-sĕr'pĭ-nȧ*). *See in Index* **Persephone.**
**Prospecting, 2248.**
**Pros'pero,** in Shakespeare's 'The Tempest', banished duke of Milan, **3465.**
**Protagoras** (*prō-tăg'ō-rȧs*) (480?–411 B.C.). Gk. philosopher, first to call himself sophist and to teach for payment; taught that "man is the measure of all things."
**Protection,** in economics, **3437.** *See also in Index* **Free trade; Tariff.**
**Protective coloration and resemblance,** among animals, **2923–6;** birds, **411–2;** cephalopods, **2280;** chameleon, **685;** fish, **1274–5;** flatfish, **1290;** giraffe, **1464;** grouse, **1544;** insects, **1784,** *pictures,* **1785;** in L. Otero basin, N.M., **2464;** leaf butterfly, **548,** *picture,* **2925;** principles applied in camouflage, **591;** rabbits, **1584;** tiger, **3499.**
**Protective tariff, 3437.** *See also in Index* **Free trade; Tariff.**
**Protec'torate,** in England (1653–59), **925, 2242.**
**Proteins** (*prō'tē-ĭnz*), foodstuffs containing nitrogen, **2926, 1320–2;** abundant in beans and peas, **347, 2698;** albumen an example, **83;** digestion of, **1010–1, 2724;** value in diet, **1322;** in potatoes, **2900;** in soy beans, **3297;** sulphur in, **3389.**
**Proterozo'ic era,** in geologic time, **1418, 1420,** *picture,* **1419.**
**Prot'estant Episcopal church.** A religious sect in America; separated from the Church of England 1789, but in belief and organization remains much the same, membership about 1,104,000.
**Protestantism,** chief denominations, **2994;** origin of term, **2988;** Denmark, **997;** Germany, **1441, 3132;** Ireland, **1807, 371;** Norway, **2536;** Sweden, **3404.** For history *see in Index* **Reformation, Protestant.**
**Proteus** (*prō'tūs*), a sea-god in Gk. myth., **2926.**
**Prothal'lium** or **Prothal'lus,** of ferns, **1234, 3173.**
**Protho'rax,** the first segment of an insect's thorax, *picture,* **1788;** movable in beetles, **371.**
**Protohip'pus,** an evolutionary ancestor of the horse, *picture,* **1682.**
**Protone'ma,** of moss, **2338,** *picture,* **2339.**
**Pro'toplasm, 2926;** the basic material of all cells and living organisms, **394, 398, 671–2;** chemical elements, **394;** in plants, **2824.**
**Protothe'ria,** subclass of mammals containing the most primitive types, **3950.**
**Protozo'a,** the single-celled animals as a group, **2927, 127, 3944;** evolutionary position, **396,** *diagram,* **128;** as disease producers, **1449–52;** as parasites, **2677.**
**Protrac'tor,** an instrument for measuring and constructing angles, **1424.**
**Prout, William** (1785–1850), Eng. physician and worker in physiological chemistry; theory of origin of matter, **711.**
**Provençal** (*prō-vän-säl'*), old Fr. dialect, spoken in Provence, **3040.**
**Provence** (*prō-väns'*), old province in s.e. France; annexed by France 1486; *map,* **1351;** literature and language, **3040;** racial character, **1344.**
**Proverbs, Book of.** Twentieth book of the Old Testament, containing a collection of the sayings of the sages of Israel; a large proportion ascribed to Solomon.
**Providence,** cap. and chief city of R.I.; pop. 237,595; **2927–8;** capitol, *picture,* **3009;** clipper trade, **233;** colonial town meetings, **3008–9;** Roger Williams founds, **3742.**
**Providence Plantations, 3009.**

**Provincetown,** Mass., town at tip of Cape Cod peninsula; pop. 4246; arrival of 'Mayflower', **2176.**

**Pro'vo,** Utah, city on Provo R., 40 mi. s. of Salt Lake City; pop. 10,303; woolen goods, flour, iron products, candy; Brigham Young Univ.; Provo Canyon, Utah Lake, and Bridal Veil Falls attract many tourists; **3612.**

**Prunes, 2928, 2840.**

**Pruning,** of fruit trees, **1380,** *picture,* **1378.**

**Pru'nus,** a genus of fruit trees, **716.**

**Prus'sia,** the largest and most powerful state of Germany; 114,000 sq. mi.; pop. over 37,000,000; **2928–9, 1439, 1440,** *maps,* **1440, 2929;** cap. Berlin, **385–6.** —*History,* **2928–9, 1672;** conquered by Teutonic Knights, **932, 1195;** under Frederick the Great, **1360–1;** gains Silesia, **1360, 2147;** partition of Poland, **2856;** in Seven Years' War, **3180–1;** in Fr. Rev. and Napoleonic Wars, **1368, 1370, 1448, 2394, 2396, 3132;** conscription adopted, **218;** serfs freed, **3249;** Rev. of 1848, **2929, 1448, 3737;** Bismarck's work, **427–8, 1448,** war with Denmark, **994, 997, 428;** Seven Weeks' War with Austria, **428, 1448, 1576, 3132;** N. German Confederation, **1448;** Franco-Prussian War, **1355–6, 427, 428, 2207;** German Empire proclaimed, **1449, 3633;** dominant position in German Empire, **2929, 1449.** *See also in Index* **Germany.**

KINGS OF PRUSSIA AND EMPERORS OF GERMANY

| | |
|---|---|
| 1701-13 | Frederick I |
| 1713-40 | Frederick William I |
| 1740-86 | Frederick II, the Great |
| 1786-97 | Frederick William II |
| 1797-1840 | Frederick William III |
| 1840-61 | Frederick William IV |
| 1861-88 | William I (Emperor of Germany 1871) |
| 1888 | Frederick III |
| 1888-1918 | William II |
| [1918 | Republic proclaimed] |

**Prussia, East.** *See in Index* **East Prussia.**

**Prussia, West.** *See in Index* **West Prussia.**

**Prussic acid.** Same as **Hydrocyanic acid.**

**Pruth** (*prụth*) **River,** a tributary of the Danube in e. Rumania; 380 mi.; *map,* **308.**

**Prynne** (*prĭn*), **Hester.** The leading character in Hawthorne's 'The Scarlet Letter', doomed to wear the scarlet letter.

**Przemysl** (*pshĕ'mishl*), Poland, town 50 mi. w. of Lemberg; pop. 55,000; thriving industries; timber and grain trade; World War siege, **3810.**

**Psalms,** the 19th book of the Old Testament; contains 150 psalms about the Exile, New Jerusalem, and the period of David; attributed to David, **967;** originally sung, **2376.**

**Psammetichus** (*săm-mĕt'ĭ-kŭs*). Name of 3 kings of the XXVI dynasty of Egypt; under the first (664–610 B.C.) Egypt recovered its prosperity after internal wars and the Assyrian invasion; Psammetichus III reigned but 6 months, being dethroned 525 B.C by the conquering Persians.

**Psilorati** (*psĕ-lō-rä'tĕ*), **Mt.,** Crete, **918.**

**Psittaci** (*sĭt'ă-sī*), the parrot order of birds, **412, 2690.**

**Pskof** (*pskŏf*) or **Pleskof,** Russia. Dilapidated old city near Esthonian border; pop. 38,000; flourished as free town and Hansa city in Middle Ages; conquered by Moscow (1510).

**Psyche** (*sī'kē*), in Gk. and Rom. myth., beautiful maiden, beloved of Cupid. **939–40.**

**Psycho-analysis** (*sī-kō-ȧ-năl'ĭ-sĭs*). Name given by Freud to method of psycho-therapy based on the theory that many nervous and mental disorders are due to repression of desires. Though rejected and completely forgotten by the conscious mind, these desires still persist in the subconscious, and before a cure can be effected, must be brought to light. In this analysis of the subconscious, the study of dreams is of great importance. *See in Index* **Freud.**

**Psychol'ogy,** the science of the mind, **2930–1;** adolescence, **25–6;** animals, instinctive behavior of, **130–1, 3841;** apperception, **158–60;** Aristotle, **196;** brain, structure and function of, **490–2;** in child training, **729–35;** habit, **1557;** hypnotism, **1717–8;** intelligence tests, **1792–3;** memory, **2197, 3373, 3374;** mind, **2247;** nerves, **2436–7, 486, 490–1;** sleep and dreams, **3250–1;** how to study, **3372–4, 2197.**

**Psycho-ther'apy, 2931, 2193;** hypnotism, **1718.**

**Psychrom'eter,** a type of hygrometer, **1717.**

**Ptah** (*ptä*), an Egypt. deity, **1106.**

**Ptarmigan** (*tär'mi-găn*), the "snow grouse." **1544, 1545,** *pictures.* **411, 1544;** altitude range, **397;** foot, *picture,* **409.**

**Pteran'odon,** prehistoric flying reptile, **134, 136.**

**Pteria** (*tē'rĭ-ȧ*). Anc. cap. of "White Syrians" (probably Hittites) of Cappadocia, Asia Minor; according to Herodotus, captured and ruined by Croesus of Lydia (6th cent. B.C.); ruins at Boghazköi.

**Pter'idophytes,** the fernlike plants as a botanical group, **2831, 3938;** include ferns, **1232–4;** horsetail rushes, **3083.**

**Pterodactyl** (*tĕr-ō-dăk'tĭl*), a prehistoric flying reptile, **134, 136.**

**Pter'osaur,** extinct sub-class of flying reptiles, **2997.**

**Ptolemies** (*tŏl'ĕ-mīz*), line of Gk. rulers of Egypt, **2931, 1107, 1657.**

**Ptolemy I** (d. 283 B.C.), general of Alexander the Great and founder of the line of "Ptolemies," **2931, 1107;** founds Alexandrian library, **88;** Pharos of Alexandria, **3178.**

**Ptolemy II, Philadelphus** (309–247 B.C.), gave chief care to encouragement of commerce and culture, and internal administration of Egypt; **1657;** built Pharos of Alexandria, **3178.**

**Ptolemy III, Euergetes** ("benefactor") (d. 222 B.C.). Became ruler of Egypt on death of his father, Ptolemy II; his armies invaded Syria and India, and his fleets conquered shores of the Hellespont and Thracian coast; under him Ptolemaic Egypt attained greatest prosperity at home and widest dominion abroad.

**Ptolemy XI** (d. 51 B.C.), father of Cleopatra and Ptolemy XII, to whom he left the kingdom; statue, *pieture.* **1206.**

**Ptolemy XII** (d. 45 B.C.), brother of Cleopatra, **2931, 789.**

**Ptolemy XIII** (d. 43 B.C.). Last of the Ptolemies, youngest son of Ptolemy XI; put to death by his sister Cleopatra to make room for her son Caesarion.

**Ptolemy** or **Ptolemaeus, Claudius,** astronomer, geographer, mathematician, **2931–2, 239, 1416;** formulates idea of gravity, **1506.**

**Ptomaines** (*tō'mānz* or *tō'mă-ĭnz*), poisons found in food, **2855;** poisoning, treatment for, **1270.**

**Ptyalin** (*tī'ă-lĭn*), starch-digesting enzyme of saliva, **1010, 1011, 1469, 1173.**

**Publicani,** Rom. tax-farmers. **3046.**

**Public debt.** *See in Index* **National debt.**

**Public health, 1612–5, 1716;** the fly menace, **1312–3;** pure food laws, **2936–7;** meat inspection, **2182;** stamping out mosquitoes, **2334–6;** in the Philippines, **2767;** plumbing and sewerage, **2840, 3183;** waterworks, **3701–4.**

**Public Health Service,** U.S., **1612, 3598.**

**Public Information, Committee on,** U.S. govt. organization during World War, **3748.**

**Public lands.** *See in Index* **Lands, public.**

**Public Safety, Committee of** (Fr. Rev.), **1370, 3027, 3028.**

**Public school,** Eng. and Amer. distinguished, **3139.** *See also in Index* **School.**

**Public utilities, 2932–3;** electric-light plants in U.S., **1124;** Interstate Commerce Commission, **1794;** railroads, **2963–71;** socialist doctrine, **3268, 3269;** transportation, **3526;** telegraph lines, **3458;** waterworks, **3704.**

**Puccini, Giacomo** (*pụt-chē'nē, ġä-kō'mō*) (born 1858), Ital. operatic composer; chief works, **2381.**

**Puck,** mischievous sprite in 'Midsummer Night's Dream', **2230.**

**Puddle butterfly,** color plate facing **548.**

**Puddling,** in iron mfr., **1824.**

**Pu'du,** smallest known deer, **981.**

**Puebla** (*pwā'blä*). State in s.-center of Mexico; 12,992 sq. mi.; pop. 1,119,000; cap. Puebla.

**Puebla.** Third city of Mexico, r.r. and mfg. center 60 mi. s.e. of Mexico City; pop. 96,000; textiles, glass, straw hats; onyx quarries near by; headquarters of Carranza in 1914.

**Pueblo** (*pwĕb'lō*), Colo., 2d city in state and one of most important industrial centers w. of Missouri R.; on Arkansas R., 115 mi. s.e. of Denver; pop. 43,050; iron and steel products; **844.**

**Pueblo Indians, 2933, 794, 1767;** in Arizona, **202;** in New Mexico, **2467;** practiced irrigation, **1828.**

**Puerto** (*pwār'tō*), Colombia. Port on n. coast serving as harbor for Barranquilla, with which it is connected by 17 mi. of railroad.

**Puerto Barrios** (*bär'ē-ōs*), chief Atlantic port of Guatemala, **1545.**

**Puerto Cortez** (formerly Caballos), Honduras, port on n.w. coast on Gulf of Honduras; pop. 2500; **1676.**

**Puerto Principe** (*prēn'sē-pā*), Cuba. Same as **Camaguey.**

**Puff-adder, 3261, 3647.**

**Puff-ball,** a mushroom, **2375;** color plate facing **2374.**

**Puffin,** a sea bird of the auk family, **259, 413.**

**"Puffing Billy,"** an early locomotive, **2962,** *picture,* **3525.**

**Pug-dog, 1023.**

**Puget** (*pū'ġĕt*) **Sound,** large inlet of Pacific Ocean entering state of Wash. at n.w. corner; begins at junction of Straits of Juan de Fuca and Georgia and extends s.; **3687, 3169.**

**Pugmill,** machine, **503, 2903.**

**Pulaski** (*pū-lăs'kĭ*), **Casimir** (1748–79), Polish count and Amer. Revolutionary hero, **2933.**

**Pulaski,** Tenn., town 70 mi. s.w. of Nashville, in agricultural and stock-raising dist.; pop. 2780; Ku Klux Klan organized, **3469.**

**Pulaski, Fort.** *See in Index* **Fort Pulaski.**

**Pulci** (*pụl'chē*), **Luigi** (1432–87), Ital. poet remembered for 'Il Morgante Maggiore', an epic based on the adventures of Roland; said to have been one of the authors read by Shakespeare.

**Pu'lex irritans,** scientific name of common flea, **1292.**

**Pulitzer** (*pū'lĭt-sẽr*), **Joseph** (1847–1911). Amer. journalist and newspaper proprietor (N.Y. *World*), pioneer in use of "human interest" stories; founder of Pulitzer School of Journalism, Columbia Univ.

**Pul'kas,** sledges of Lapps, **1962.**
**Pulkowa** (*pụl'kō-vȧ*) or **Pulkova,** Russia, village 10 mi. s. of Petrograd; observatory, **2552.**
**Pulley,** a mechanical device, **2188–9;** Archimedes, **175.**
**Pullman, George Mortimer** (1831–97). Amer. promoter, inventor, with Henry Wagner, of the Pullman sleeping car; president of Pullman Palace Car Co., and founder of Pullman, Ill. (now part of Chicago).
**Pullman Company,** 2965; strike of 1894, **791.**
**Pul'monary artery, 1616;** *pictures,* **1616, 2083.**
**Pulmonary circulation, 1616–7, 438.**
**Pulmonary valve,** *picture,* **1616.**
**Pulmonary veins,** *pictures,* **1616, 2083.**
**Pul'motor,** instrument to induce artificial breathing, **1269,** *picture,* **1260.**
**Pulque** (*pụl'kā*), Mex. beverage, **2213, 42,** *picture,* **2215.**
**Pulse.** Collective name for leguminous plants (peas, beans, etc.), or for their edible seeds. *See in Index* **Legumes.**
**Pulse,** rhythmic beating of the arteries, **2933, 1615.**
**Pultowa** (*pụl-tō'wạ*). Same as **Poltava.**
**Pultusk** (*pụl'tụsk*), Poland. Mfg. and trading town on Narev, 30 mi. n. of Warsaw; pop. 16,000; Charles XII of Sweden defeated Saxons and Poles (1703), and French fought Russians (1806).
**Pu'lu,** Hawaiian fern, **1234.**
**Pu'ma,** animal of cat family, **2933–4.**
**Pum'ice,** a spongy form of lava, **1972.**
**Pump, 2934,** *pictures,* **2935, 3696;** air pressure in, **53;** centrifugal type, *picture,* **1041;** hydraulic ram, **1708,** *picture,* **1709;** suction, **53;** "surface tension" type, **3694;** vacuum, **53.**
**Pum'pernickel,** bread, **3102, 1303.**
**Pump'kin, 2934;** belongs to squash family, **3333;** related to gourd, **1492;** when and how to plant, **1397.**
**Puna** (*pụ'nȧ*), India. Same as **Poona.**
**Punch,** a tool, **3514, 3516.**
**Punch and Judy,** a puppet show, **1219, 1228.**
**Punctuation, 2934, 2936, 1493.**
**Pu'nic Wars,** series of conflicts between Rome and Carthage (264–146 B.C.), **651, 3046;** Hannibal, **1575–6;** Spanish mines a cause, **3242.**
**Punishment,** of criminals, **2918–20;** in training of children, **730.**
**Punjab** (*pŭn-jäb'*), a Brit. province in n.w. India; 99,779 sq. mi.; pop. 20,000,000; **1745, 1777, 991,** *maps,* **1744, 1745.**
**Punt,** in football, **1326.**
**Punta Arenas** (*pụụn'tä ä-rā'näs*), port and coaling station of Chile on n.w. shore of Strait of Magellan; pop. 20,000; mining, stock-raising dist.; exports wool, **3286.**
**Puntarenas** or **Punta Arenas,** port of Costa Rica; pop. 5000; **896.**
**Punxsutawney** (*pŭnks-ụ-tạ'nī*), Pa. Center of great bituminous coal and coke region, about 70 mi. n.e. of Pittsburgh; pop. 10,311; iron and glass products.
**Pu'pa,** 3d stage in life of insect, **2936, 1785–6;** honey-bee, **360,** *picture,* **1787;** beetles, **368,** *pictures,* **368, 369;** butterflies and moths, **546, 661,** *pictures,* **548, 661;** carpenter bee, *picture,* **363;** fly, **1312;** mosquito, *pictures,* **2335.**
**Pupil** of the eye, **1213,** *picture,* **1214.**
**Puppet plays, 1219, 1228.**
**Puranas** (*pụ-rä'nȧs*), Sanskrit religious writings, **1651, 1755.**
**Purari** (*pụ'rä-rē*) **River,** New Guinea, **2453.**
**Purcell** (*pûr'sĕl*), **Henry** (1658–95). Eng. musical composer, called "father of English melody."
**Purdue University,** co-ed. state institution at Lafayette, Ind.; organized 1869, opened 1874; agriculture, engineering, science, pharmacy; agricultural experiment station; **1762.**
**Pure food laws, 2936–7, 3060;** preservatives, **151, 1332;** candy, **630;** U.S.P. drugs, **1042;** oleomargarine regulation, **2579;** vinegar, **3644.**
**Pur'gatory,** in Dante's 'Divine Comedy', **960.**
**Puri** (*pụ'rē*), India. *See in Index* **Jagannath.**
**Pu'rim,** a Jewish festival, commemorating story of Esther, **1180.**
**'Puritan, The',** statue, **3107.**
**"Puritan Poet," 1165.**
**Puritans and Puritanism, 2937;** Calvin's influence, **587;** and Charles I, **692–3;** Cromwell, **924–6;** festivals prohibited, **759, 2175;** hats, **1598;** influence on English literature, **1165;** and James I, **1860;** Milton champions, **2242–3;** theaters closed, **1034.** —*In America:* Boston, center of, **472–3;** interpreted by Hawthorne, **1607, 1609;** in Maryland, **2163;** in Massachusetts, **2170;** music, **2379–80;** Plymouth settlement, **2841–6, 2175–8;** Roger Williams, **3742.** *See also in Index* **Civil War** (England); **Commonwealth.**
**'Purity',** a Little Talk by Arthur Mee, **2938,** *picture,* frontispiece, Vol. 6.
**Purple,** a secondary color, **837;** made from murex, **2774.**
**"Purple and fine linen," 2018.**
**Purple grackle, 432–3.**
**Purple martin, 3398.**
**Purple of Cassius,** a pigment, **1482.**
**Purpura,** a shellfish; eggs, *picture,* **1091.**
**Purpure,** in heraldry, **1639.**
**Purse-seine,** a fish-net, **1285.**
**Purs'lane,** a weed, **3712.**
**Purus** (*pụ-rụs'*) **River,** one of chief southern tributaries of the Amazon; navigable for 800 mi. of its 1850 mi. course; *map,* **494.**
**Pusey** (*pū'zĭ*), **Edward Bouverie** (1800–82). Eng. theologian, leader in Oxford movement.
**Push'kin, Alexander** (1799–1837), greatest Rus. poet; his gentle humor and keen wit produced some of the best epigrams in any language; originally imitative of Byron, his later work was entirely original in character and method; **3097;** chief works, **3098.**
**"Puss in a Corner,"** game, **2835–6.**
**'Puss in Boots',** source of story, **1318.**
**"Puss in the Circle,"** game, **2835,** *picture,* **2833.**
**Puss moth caterpillar,** *picture,* **545.**
**Pussy willow, 3742–3, 3534.**
**Put-in-Bay,** L. Erie, **1174;** Perry Memorial, **2730.**
**Putnam, Israel** (1718–90), Amer. Rev. soldier, **2939;** at Bunker Hill, **533.**
**Putnam, General Rufus** (1738–1824), Amer. soldier, cousin of Israel Putnam; served in Revolution in New England campaigns; one of the organizers of the Ohio Co.; founds Marietta, Ohio, **2572.**
**Putrefac'tion, 399, 302, 1232.**
**Putter,** a golf club, *pictures,* **1486, 1485.**
**Putty, 2939;** contains chalk, **685.**
**Putumayo** (*pụ-tụ-mī'ō*) **River,** in S. Amer., rises in Andes in s.w. Colombia, flows s.e. about 800 mi. to Amazon; *map,* **835;** Indian atrocities, **2742; 836.**
**Puvis de Chavannes** (*pü-vē' dē shä-vän'*), **Pierre** (1824–98). Fr. painter, restored mural painting to its proper function of decoration (grand staircases of Boston Public Library, Paris City Hall, Lyons Museum).
**Pu-Yi** (Hsuan-Tung) (born 1906), last emperor of China, succeeded 1908; dethroned 1911 by revolution; temporary restoration 1917; apology for misgovernment, **746.**
**Puz'zolan,** cement made of slag, **674.**
**Pydna** (*pĭd'nȧ*). Gk. town in anc. Macedonia on Thermaic Gulf; subduced by Macedonian kings; victory of Romans under Aemilius Paulus over Perseus, last king of Macedonia (164 B.C.).
**Pye** (*pī*), **Henry James** (1745–1813), Eng. poet, **2848.**
**Pygmalion** (*pĭg-mā'lĭ-ȯn*). In Gk. legend, a sculptor who fell in love with an ivory image he had made; Aphrodite heard his prayers and granted life to the image, so that Pygmalion might marry her; story told in Ovid's 'Metamorphoses', used in Gilbert's comedy 'Pygmalion and Galatea'.
**Pygopodes** (*pī-gŏp'ō-dēz*), the diving bird order, **412, 413.**
**Py'gostyle,** tail-bone of birds, **400.**
**Pyle** (*pīl*), **Howard** (1853–1911), Amer. painter, illustrator, and author ('Adventures of Robin Hood'; 'The Story of Sir Launcelot', etc.), **2634.**
**Py'lon,** a gateway; in Egyptian architecture one having truncated pyramidal form, *pictures,* **1104, 1101.**
**Pylor'ic orifice,** of stomach, **3360.**
**Pym** (*pĭm*), **John** (1584–1643), Eng. statesman, parliamentary leader, conspicuous in struggle against Charles I; and John Hampden, **1570.**
**Pyorrhoe'a,** a disease of the sockets of the teeth, **1452, 3454.**
**Pyr'alin,** artificial celluloid-like substance, **673.**
**Pyr'amid Lake,** Nevada; 30 mi. long; at elevation of 3880 ft. above sea; receives Truckee R. from s.; **2447,** *map,* **2445.**
**Pyramids,** famous tombs in Egypt, **2939–40, 568–9, 1099–1100,** *pictures,* **1094, 570;** how built, **528,** *picture,* **178.**
**Pyramids, battle of the** (1798), victory gained near Egyptian pyramids by French under Napoleon over Mamelukes under Murad Bey, **2393, 1107.**
**Pyramus** (*pĭr'ȧ-mŭs*), hero of the classic story of Pyramus and Thisbe, parodied in the interlude of 'Midsummer Night's Dream', **2230.**
**Pyr'enees Mts.,** between France and Spain; highest peak 11,168 ft.; **2940, 1192, 3299, 2358,** *picture,* **3305,** *maps,* **1190–1, 1351;** iron, **3301;** mules, **1346;** railroads, **3300;** retard Span. commerce, **3302.**
**Pyrites** (*pī-rī'tēz*) **of iron,** "fool's gold," a sulphur compound, **3390, 1479.**
**Pyrom'eter, 2941;** why platinum is used, **2831.**
**Pyrotechnics** (*pī-rō-tĕk'nĭks*), making or using fireworks, **1264–6.**
**Pyrox'ilin,** collodion-cotton, **673;** base of collodion, **833;** basis of celluloid, **673.**
**Pyr'rha,** in Gk. myth., wife of Deucalion, **1000.**
**"Pyrrhic** (*pĭr'ĭk*) **victory," 2941.**
**Pyrrhus** (*pĭr'ŭs*), king of Epirus (318?–272 B.C.), **2941;** aids Gk. cities, **3044;** ambassador defied by Rome, *picture,* **3047.**
**Pythagoras** (*pī-thăg'ō-rȧs*) (582?–500 B.C.), Gk. philosopher and mathematician, **2941–2, 1422.**
**Pythagore'an the'orem,** in geometry, **1422.**
**Pyth'eas,** Massilian navigator of 4th cent. B.C.; **1416.**
**Pyth'ia,** priestess of Delphi, **991.**
**Pythian games, 156, 991;** winners crowned with laurel, **962.**
**Pyth'ias, Damon and, 957.**
**Pythias, Knights of, 957.**
**Py'thon,** in Gk. myth., slain by Apollo, **156.**
**Python,** a snake, **2942;** egg, *picture,* **1091;** not a boa, **440.**

# Q

THE Egyptian picture sign ⊿ from which our Q is descended represents either an angle or a knee, which of course forms an angle when bent. In the Egyptian script this sign takes a form which begins to look a little like our Q. The Phoenicians formed it like this ϕ and named it *Qoph*. Scholars disagree as to just what this word means. Some say it means "ape" and that the character represents an ape with its tail hanging down. Another theory is that it represents an aperture of some kind, the eye of a needle, perhaps. Others think it is the picture of an ear, and still others, that of a knot. As pronounced by the Phoenicians and Hebrews, it was a very strong sound that did not need the help of any other letter. Its name and sound were similar to that of *Kaph* (the Phoenician K), but it was sounded farther back in the throat. We do not find the letter Q in the classic or modern Greek alphabet, for, although it once had a place there, it was dropped (except as a numeral) at a very early date. But the Romans kept it and gave it its present form. They used the letter, as we do, with *u*, the combination *qu* having the sound of *kw*. In French *qu* generally stands for the *k* sound, as in *coquette*.


**"Q-ships,"** 3378.
**Quad'rant,** in geometry, **1423.**
**Quad'ruplex telegraphy,** 3456.
**Quaes'tors,** officials of anc. Rome, **3044.**
**Quag'ga,** a zebra-like animal, **3838.**
**Quahaug** (*kwą'hôg*), a clam, **783;** shells used for beads, **3202.**
**Quai d'Orsay** (*kā dôr-sā'*). The Fr. foreign office, so named from the quay on the s. bank of the Seine in Paris where its buildings stand.
**Quail,** a fowl-like game bird, **2943,** *picture,* **414.**
**"Quaker Poet,"** 113.
**Quakers.** *See in Index* **Friends.**
**Quaking asp** or **trembling poplar,** *pictures,* **2879.**
**Quaking bog,** 2340.
**Qualitative analysis,** in chemistry, **715.**
**Qu'Appelle** (*kà-pĕl'*) **River** (French, "Who calls?"), tributary of the Assiniboine in s. Saskatchewan, *map,* **602–3.**
**Quar'antine,** 1612.
**Quar'rying,** 2943–5. *See also in Index* **Granite; Limestone; Marble; Slate.**
**Quart,** a unit of measure, **3715.**
**Quartering,** in heraldry, **1639.**
**Quar'termaster corps,** of U.S. Army, **217, 3599;** insignia, **3576.**
**Quarter-section,** 1960.
**Quartet',** in music, **2584.**
**Quar'to,** 458.
**Quartz,** a hard rock, **2945;** contains silicon, **3233;** flint a variety, **1292;** gold found in, **1479;** made into fire-resisting glass, **1383;** relative hardness, **2248;** sand a form, **3123.**
**Quartz'ite,** a metamorphic rock, **2945.**
**Quasimodo** (*kwās-ĭ-mō'dō*). A dwarf, one of chief characters in Victor Hugo's 'Notre Dame'.
**Quater'nary period,** in geologic time, **1418, 1420,** *picture,* **1419.**
**Quat'rain,** in poetry, **2851.**
**Quatre-Bras** (*kä-tr-brä'*). Village 19 mi. s.e. of Brussels; indecisive battle between British and Germans under Wellington and French under Ney, on June 16, 1815, 2 days before battle of Waterloo.
**Quay, Matthew Stanley** (1833–1904). U.S. senator from Pennsylvania, 1887–1904; for 35 years leader of Republican party in his state and from 1885 a member of the national committee.
**Quebec** (*kwē-bĕk'*), oldest and largest of provinces of Canada; 707,000 sq. mi.; pop. 2,400,000; **2945–7,** *map,* **602–3;** asbestos mine, *picture,* **225;** education, **622, 2317;** history, **2947** (*see also in Index* **Canadian history**); legislature, **622;** Montreal, **2317;** national parks, **2400;** Parliament buildings, *picture,* **2948;** salmon, **3113.**
**Quebec, City of,** cap. of province of Quebec on St. Lawrence R.; pop. 120,000; **2948–9,** *pictures,* **618, 620, 2948, 2949, 3108;** cantilever bridge, **506,** *picture,* **507;** Champlain, statue of, *picture,* **622;** Champlain founds, **687,** *picture,* **619;** captured 1759 by British under Wolfe, **3775, 1362.**
**Quebec Act.** A measure passed by Brit. Parliament 1774 extending province of Quebec to Ohio and Mississippi rivers, establishing Fr. civil law in the province, and withholding representative institutions; provoked great resentment among Eng. colonists and helped bring on Rev. War.
**Quebec Bridge, 506,** *picture,* **507.**
**Quebracho** (*kā-brä'chō*), S. Amer. tree of the sumach family with exceedingly hard, heavy wood; in Paraguay, **2677;** yields tannin, **1976.**
**Quebracho, red,** and **white.** S. Amer. trees of the dogbane family; bark yields tannin; white quebracho bark contains aspidospermine, an alkaloid used in bronchial troubles.
**Queen Anne, Age of,** in English literature, **1165.**
**Queen Anne's lace,** a wild carrot, **650, 3712.**
**Queen Anne's War** (1701–13), **1664.**
**Queen bee, 360–2,** *picture,* **359.**
**Queen Charlotte Islands,** part of British Columbia 100 mi. off coast and 135 mi. above Vancouver Isl.; 5100 sq. mi.; coal and other minerals; pop. less than 1000, mostly Indians; *map,* **602–3.**
**Queen Charlotte Islands,** Melanesia. Same as **Santa Cruz.**
**"Queen City of the Adriatic,"** 3623.
**"Queen City of the Lakes,"** 527.
**"Queen City of the Plains,"** 841.
**"Queen City of the South,"** 2468.
**Queen of Sheba,** 3274.
**"Queen of the Antilles,"** 936.
**Queens, Borough of,** part of New York City, **2488, 2498,** *map,* **2488.**
**Queensberry rules,** for boxing, **476.**
**Queen's College,** Oxford, founded, **2610.**
**Queen's County.** In s.e. Ireland; 664 sq. mi.; pop. 55,000; dairy farming; cap. Maryborough.
**Queensland,** a state in n.e. of Australia; 670,500 sq. mi.; pop. 738,000; **2949–50,** *map,* **264;** dance of natives, *picture,* **2119.**
**Queenstown,** seaport in s. Ireland; pop. 8000; **2950.**
**Queen's University.** One of leading Canadian universities, at Kingston, Ontario; founded 1841 by Presbyterians but since 1912 non-sectarian; co-ed.; arts and science, theology, applied science, medicine, education.
**Queen Victoria Niagara Falls Park,** 2504.
**Queen wasp, 3690–1,** *picture,* **3693.**
**Quercus** (*kwĕr'kŭs*), the oak genus of trees, **2548.**
**Querétaro** (*kā-rā'tä-rǭ*), Mexico. State in center; 4493 sq. mi.; pop. 248,000; cap. Querétaro.
**Querétaro,** Mexico. Cap. of state of Querétaro, 110 mi. n.w. of Mexico City; pop. 33,000; large cotton mills.
**Quern,** a hand-mill, **1301.**
**Quervain, Dr. A. de,** leader of Swiss expedition across Greenland in 1912; route, *map,* **1540.**
**Quet'ta.** An important fortified frontier town of Baluchistan at end of Bolan Pass; terminus of r.r. from India; occupied by British; pop. 30,000.
**Quetzal** (*kĕt-säl'*), a beautiful bright green crested bird with tail feathers 2 or 3 ft. long; plumage used as decorations for priests and royalty among Aztecs and Mayas; national emblem of Guatemala, **1546.**
**Quetzalcohuatl** (*kĕt-säl-kō-ä'tl*). A hero-god of the Aztecs; represented as author of their civilization.
**Queues** (*kūz*) or **pigtails,** in China, **742;** 18th cent. dress, **898, 900.**
**Quiberon** (*kē-bē-rôñ'*), France. Historic town on Bay of Quiberon on peninsula 22 mi. s.e. of Lorient; defeat of French Royalists by republicans (1795).
**Quiberon Bay.** Small arm of Bay of Biscay e. of Quiberon; scene of Brit. naval victory under Admiral Hawke over French under Conflans Nov. 20, 1759 (Seven Years' War).
**Quichuas** (*kē'chwäz*). A family of S. Amer. native tribes in Peru, Ecuador, and Bolivia; formed greater part of anc. Inca Empire. *See in Index* **Incas.**
**Quicklime,** unslaked lime, **571, 2010.**
**Quicksands,** 3122.
**Quicksilver.** Same as **Mercury.**
**Quill,** part of feather, **1228;** of porcupine, **2883.**
**Quiller-Couch** (*kwĭl-ẽr-kuch'*). **Sir Arthur Thomas** (born 1863). Eng. writer, known under pseudonym "Q"; professor of English literature at Cambridge; edited 'Oxford Book of English Verse'; completed

R. L. Stevenson's unfinished novel 'St. Ives'; author 'Poems and Ballads', 'The Golden Pomp', 'Dead Man's Rock', and many other volumes of verse, criticism, and romance.
**Quill pens, 2709–10.**
**Quince,** a fruit tree of the apple family, **2950;** classified, **3533.**
**Quincy, Josiah** (1772–1864), Amer. statesman and author, b. Boston, Mass.; member national House of Representatives, and of Mass. state senate; pres. of Harvard 1829–45; advocates secession, **2073.**
**Quincy,** Ill. Mfg., r.r., and trade center 92 mi. w. of Springfield, on Mississippi R.; pop. 35,978; foundry products, carriages, machinery, flour.
**Quincy,** Mass., residential suburb of Boston across Neponset R.; pop. 47,876; granite quarrying, ship building; many historic associations; birthplace of John Adams, John Quincy Adams, and John Hancock; **472;** first railway, **2963.**
**Quinebaug River,** Conn., stream 100 mi. long uniting with Shetucket to form Thames, *map,* **864.**
**Quinine** (*kwī'nīn* or *kwĭ-nēn'*), a drug from cinchona bark, **2950;** from Ceylon, **685;** chemical properties, **10;** Eucador, **1079;** Java, **1879;** Peru, **2742;** minimum which taste can detect, **3513.**
**Quin'nat salmon, 3113.**
**Quinnipiac,** Indian name for New Haven, Conn., **2456.**
**Quin'oline,** colorless liquid distilled from coal-tar, **814.**
**Quin'tal,** a metric unit of weight, **2206.**
**Quintana Roo** (*kēn-tä'nä rọ*). Territory in e. part of Yucatan peninsula, on Caribbean Sea; 19,270 sq. mi.; pop. 10,000; cap. Santa Cruz de Bravo.
**Quinte** (*kwĭn'tĕ*), **Bay of,** inlet of L. Ontario on s.e. coast of Ontario, Canada; Trent Canal, **627.**
**Quintero** (*kēn-tā'rō*), **Serafin Alvarez** (born 1871) and brother **Joaquin** (born 1873), Span. dramatists; collaborators in brilliant comedies; **3307.**
**Quintet',** in music, **2584.**
**Quintil'ian** (Marcus Fabius Quintilianus) (35?–95? A.D.), Rom. critic, **1967.**
**Quintus Fabius Maximus.** *See in Index* **Fabius.**
**Quipu** (*kē'pụ*), anc. Peruvian device for keeping records, **1741.**
**Quir'inal Hill,** Rome, **3056.**
**Quirinal palace, 3057.**
**Quiri'nus,** Rom. deity, **3058.**
**Quito** (*kē'tō*), cap. of republic of Ecuador in n. about 15 mi. s. of equator; pop. 70,000; univ.; the northern cap. of Incas until taken by Spaniards in 1534; **1078;** climate, **795, 3285;** railroad, **1079.**
**Quivira** (*kē-vē'rä*), settlement about present Great Bend, Kan., sought by Coronado, **892.**
**Quixote, Don.** *See in Index* **Don Quixote.**
**Quo'rum.** The number of members of an organized body whose presence is necessary for the legal transaction of business; in U.S. Congress a quorum is a majority of the whole number of members.
**Quotation marks,** use of, **2936.**
**Quotient** (*kwō'shĕnt*), in arithmetic, **1015;** decimal, **973, 974.**
**'Quo Vadis'** (*kwō vä'dĭs*) (Lat., "Whither goest thou?"), novel by Sienkiewicz, **2541.**

# R

OUR letter R is generally traced back to the old Egyptian hieroglyph  representing a mouth. Written in a running hand (the so-called hieratic form) it became  The Phoenicians, writing on stone, gave it a more angular form  and called it *Resh*, meaning "head," from its fancied resemblance to the head supported by the neck. The Greeks faced it about and then later rounded it so that it looked just like our P. We should have had two letters with exactly the same form, had they not added a little tail, which made the letter R as we have it today. The Romans kept this form, but the Greeks, who had developed the form  for P, dropped the tail again, so their letter R (*Rho*) is still written **P**. No other consonant shows so many variations in pronunciation as the letter R. In France and Germany it is trilled. In England and America it varies greatly according to the locality. Thus in the eastern and southern parts of the United States, when no vowel sound follows it, as in *care, tire, four*, it is either not pronounced at all, or pronounced as a slight consonant, or converted into an obscure vowel. Of the close relationship between L and R, we have already spoken in the story of L.

**Ra** (*rä*) or **Re,** Egyptian sun-god. *See in Index* **Ammon.**

**Raab** (*räb*) or **Györ** (*dyĕr*), Hungary. Town at confluence of Raab and Little Danube rivers, 65 mi. w. of Budapest; pop. 45,000; former fortress; machinery, cutlery, oil; farm trade.

**Rabbit.** *See in Index* **Hares and rabbits.**

**Rabelais** (*rä-bē-lā'*), **Francois** (1493?–1553), celebrated Fr. satirist and humorist, **2951, 1364.**

**Rabies.** Same as **Hydrophobia.**

**Raccoon** (*rä-kọn'*), **2951–5;** story, "Mr. Coon Who Wouldn't Change His Mind," **2952–5;** fur, **1389, 1390.**

**Raccoon Mountain** in n.e. Ala.; flat-topped mt. in s. Appalachians; 1800 ft.; **70.**

**Raceme** (*rà-sēm'*), a type of flower, **1305.**

**Racer snake, 3260.**

**Races of mankind, 2956–7;** *Study Outline,* **3866–9;** African races, **37;** Aryans, **224, 2771;** Caucasian, origin of name, **664;** Celts, **673–4;** classification, **2956,** by hair, **1560,** by language, **2771–2;** distribution in Asia, **228;** distribution in Europe, **1194–5;** Eskimos, **1174–7;** Esthonians and Finns, **1180, 1248;** gipsies, **1462–3;** Hamitic, **37, 2771;** of India, **1748;** Indians, N. Amer., **1764–76;** Magyars, **1702–3;** Malays, **2130;** Mongols, **2285–6;** negro, **2434–5,** *pictures,* **3283;** prehistoric, **2133–4, 1957;** Semitic, **37, 2771;** South Sea island types, **2619–21, 2451;** Slavs, **3250;** Tatars, **3440;** Turks, **3557, 3558–9;** vital statistics of principal groups, **2881.** *See also in Index* **Indo-European peoples** and other races by name.

**Ra'chel.** Favorite wife of Jacob, for whom he served 14 years; mother of Joseph and Benjamin.

**Rachel,** stage name of Elizabeth Rachel Félix (1821–58), Fr. tragic actress; unequaled in such rôles as Racine's 'Phèdre'; **1892.**

**Rachmaninof** (*räĸ-mä'nē-nŏf*), **Sergei V** (born 1873), Rus. composer and pianist, after Paderewski the greatest of contemporary pianists; chief works, **2381.**

**Racine** (*rà-sēn'*), **Jean Baptiste** (1639–1699), Fr. dramatist, **2957.**

**Racine,** Wis., industrial city and port on L. Michigan 50 mi. n. of Chicago; pop. 58,593; trade and industries, **3771.**

**Rack,** instrument of torture, *picture,* **2919.**

**Racket,** tennis, **3469,** *pictures,* **3471.**

**Raclawice** (*rät-slä-vēt'sē*), **battle of,** fought at village of Raclawice n. of Cracow 1794; Russians defeated by Poles under Kosciusko; **1944.**

**Rad'cliffe College,** at Cambridge, Mass.; women; organized 1879; non-sectarian; arts and science, education, art and music; **2170.**

**Radetzki** (*rä-dēts'ki*), **Josef Wenzel, Count** (1766–1858), Austrian field-marshal; crushed rising for Ital. independence (1848–49); **1354.**

**Radiant,** apparent center of shower of meteors, **2204.**

**Radiant heat, 1619–20;** consists of long ether waves, **3312.**

**Radiation of heat, 1619–20;** checked by clouds and smoke, **1000, 1380;** in heating systems, **1622.**

**Ra'diator,** automobile, **281.**

**Ra'dio.** *See in Index* **Wireless telegraph and telephone.**

**Radioactivity, 2959–61,** *picture,* **2958.**

**Radiola'ria,** order of unicellular animals with silica spines, **3944.**

**Radio-telegraphy and telephony, 3758–67;** audions, **257, 3766,** *pictures,* **3759, 3761;** damped and undamped waves, **3762;** Marconi's work, **3760–1, 2145–6;** preliminary discoveries by Maxwell and Hertz, **3760, 3766, 1122;** receiving, **3760–1, 3766;** transmitting, **3760–1;** tuning, **3762.**

**Rad'ish,** plant of cabbage family, **553, 555,** *picture,* **554;** when and how to plant, **1397.**

**Rad'isson, Pierre Esprit, Sieur de** (17th cent.), Fr.-Canadian explorer and fur trader, **617, 3582, 3772;** and Pepys, **2052;** stimulates fur trade, **1692.**

**Ra'dium,** a chemical element, **2958–61;** as basis for calculating earth's age, **1060;** from Colorado's carnotite ore, **841;** generates helium, **1629;** in mineral springs, **207.**

**Ra'dius,** in geometry, **1423.**

**Rad'ula,** tongue-like rasping structure in snails, **3256.**

**Raeburn, Sir Henry** (1756–1823). Scotch portrait painter; produced forcible, telling likenesses, distinguished by broad effects, but sometimes defective in color; frank, sincere, and free from artifice.

**Raemakers, Louis** (born 1869) A Dutch cartoonist who won world-wide reputation by his powerful, often bitter, anti-German cartoons during World War.

**Raf'fia,** a palm fiber, **343.**

**Raft spider, 3324.**

**"Rag doll,"** for testing corn, **889.**

**Ragusa** (*rä-gụ'zä*), Jugo-Slavia, Adriatic port of Dalmatia, 38 mi. n.w. of Cattaro; large medieval commerce; center of Serbian culture 15th to 17th cents.; **272–3.**

**Ragweed** or **hogweed,** a common weed of N. Amer. of the genus *Ambrosia;* grows 1 to 3 ft. high, with small green flowers; an annual, **3712.**

**Rah'way,** N.J. Residential city on Rahway R. 15 mi. s.w. of New York City; pop. 11,042; chemical works, printing houses, shirt and lace factories; scene of battle of Spanktown in Rev. War.

**Raikes, Robert** (1735–1811), Eng. philanthropist; founds first Sunday school, **3395.**

**Rail,** a water bird, **2961;** distinguished from coot, **880;** related to cranes, **3365;** seasonal migration, **2231.**

**Railroads, 2962–72;** in Africa, **41, 97;** air-brake, **492–3;** Australian, **264, 265;** Berlin-to-Bagdad, **304, 2201;** in Canada, **601, 602, 603;** Chicago world's greatest center, **721, 723;** construction, **2964–6,** *picture,* **2967;** early development, **2962–3, 3353;** early opposition to, **1797;** electrification, **2967–8, 1125,** *picture,* **2969;** engineering wonders, **3417,** *pictures,* **3420, 2966, 583;** Florida East Coast, **1297, 1921;** govt. regulation, **2971, 1794, 2932;** importance in modern life, **3526, 2963–4;** in India, **1752;** locomotives, **2043–4;** northernmost, **2534;** rolling stock, **2965–6, 2894–5, 2989–90;** signal and safety devices, **2966, 2968–70;** S. Amer., **3288–9, 737, 192, 450;** terminal stations, **2966,** *picture,* **2496;** Trans-Andean, **737, 123;** Trans-Siberian, **2963, 3228;** tunnels, **3550–2;** in U.S., **2963, 72, 2044, 1649.**

**Rails** (railroad), **2964–5,** *pictures,* **1821–3.**

**Railway Mail Service, U.S., 2894,** *pictures,* **2895.**

**Railways, street.** *See in Index* **Street railways.**

**Rain and rainfall, 2972–4;** affected by mts., **122, 200, 795, 1650, 1747;** affects land forms, **3023, 2790–1;** Africa, *map,* **40–1;** Asia, **228, 230;** *map,* **232–3;** in Assam, **230, 1747;** Australia, **262, 2471,** *map,* **264–5;** clouds, **809;** Europe, **1188,** *map,* **1190–1;** Indian monsoons, **1747;** N. Amer., **2516–7,** *map,* **2514–5;** "rain-makers," **2118;** S. Amer., *map,* **3288–9;** thunder showers, **3366;** U.S. rainfall, **3588;** Weather Bureau forecasts, **3708.**

**Rainbow, 2972, 3311, 1998.**

**Rainbow Bridge,** in Ariz., *picture,* **203.**

**Rainbow Bridge,** Utah, natural bridge 309 ft. above water, with 278 ft. span, **2400.**

**Rainbow trout, 3545.**

**Rain-crow,** Amer. cuckoo, **939.**
**Rain gauge, 2974, 3708,** *picture,* **3709.**
**Rainier** (*rā'ner*) or **Tacoma, Mt.,** glacier-capped volcano in Cascade Range, Wash., 50 mi. s.e. of Tacoma; 14,408 ft.; **3687,** *picture,* **3686;** extinct volcano, **3658;** why its cone is steep, **1972.**
**Rain-in-the-Face,** Sioux Indian chief, **3822.**
**Rainy Lake,** a picturesque irregular lake nearly 50 mi. long forming part of the boundary between Canada and Minnesota; drains through Rainy R. into Lake of the Woods; *map,* **2254.**
**Raisin River Massacre.** *See in Index* **Frenchtown.**
**Raisins, 2974;** California production. **582.**
**Raisuli** (*rä-ĭ-sụ'lē*), Moroccan bandit, **2327.**
**Rajah** (*rä'jȧ*) **silk, 3237.**
**Rajput** (*räj-pụt'*), a people of India, **1748,** *picture,* **1752.**
**Rajputana** (*räj-pụ-tä'nȧ*), large inland region in n.w. India, including 21 native states; 128,987 sq. mi.; pop. 10,530,000; **1745;** architecture, *pictures,* **1742, 1746, 1755.**
**Raleigh** (*rą'lī*), **Sir Walter** (1552–1618), Eng. soldier, sailor, and historian, **2974–6;** establishes first Eng. colonies in N. Amer., **2520–1;** expeditions to Guiana, **1547;** introduces mahogany to Europe, **2124;** describes Orinoco R., **2600;** and potatoes, **2900, 1440;** introduces tobacco into England, **3508;** spreads cloak for Queen Elizabeth, *picture,* **1137.**
**Raleigh, Sir Walter** (1861–1922), Eng. man of letters; professor of Eng. literature at universities of Glasgow and Liverpool ('The English Novel'; 'Style'; 'Shakespeare'; 'Milton'; 'Six Essays on Johnson').
**Raleigh,** N.C., cap. of state, a little n. of center; pop. 24,418; important cotton and tobacco market; cotton, fertilizer, machinery, etc.; **2520;** capitol, *picture,* **2521.**
**Ram,** a male sheep, **3198.**
**Ram,** a sign of the zodiac, **3840.**
**Ram, hydraulic, 1708,** *picture,* **1709.**
**Rama** (*rä'mȧ*), in Hindu myth., one of incarnations of the god Vishnu, hero of geat Hindu epic Ramayana, **1755.**
**Ramadan** (*räm-ȧ-dän'*), month of fasting among Mohammedans, **2276.**
**Ramayana** (*rä-mä'yȧ-nȧ*), Hindu epic, **1755.**
**Rambaud** (*räṅ-bō'*), **Alfred Nicolas** (1842–1905). Fr. historian ('History of Russia'; 'History of French Civilization').
**Rambler rose, 3066,** *picture,* **3067.**
**Rambouillet** (*räṅ-bụ-yȧ'*), **Catherine de Vivonne, Marquise de** (1588–1665). Founder of first great Fr. literary salon (satirized by Molière in 'Les Précieuses Ridicules').
**Rambouillet,** a breed of sheep, **3200.**
**Ramee** (*rä-mā'*), **Louise de la.** *See in Index* **Ouida.**
**Ram'eses II,** king of Egypt (13th cent. B.C.), **1106,** *picture,* **1103.**
**Ramie** (*răm'ī*), or **China grass,** fiber of Asiatic plant belonging to nettle family, **1407, 2667.**
**Ramillies** (*rä-mē-yē'*). Village in cent. Belgium 28 mi. s.e. of Brussels where Marlborough defeated French 1706 in Seven Years' War; severe fighting in 1914.
**'Ramo'na',** romance by Helen Hunt Jackson, **3124.**
**Ramoth-gilead** (*rā'mŏth-gĭl'ē-ăd*). In biblical times, city in Palestine e. of Jordan R.
**Ram'pant,** in heraldry, **1639.**
**Rampol'la, Mariano Marquis del Tindaro, Cardinal** (1843–1913), Rom. prelate, created cardinal and papal secretary of state 1887; retired 1903; and Benedict XV, **382.**
**Ramsay** (*răm'zi*), **Lady Patricia** (born 1886), formerly Princess Patricia of Connaught; patroness of famous Princess Pat's regiment of Canada; resigned royal title upon marriage to Capt. Alexander Ramsay; *picture,* **291.**
**Ramsay, Sir William** (1852–1916), Brit. chemist; discovered helium, neon, krypton, and xenon; knighted 1902; Nobel prize 1904; discovery of argon, **50.**
**Rams'gate,** England. Seaside resort 70 mi. s.e. of London; pop. 30,000; coasting and fishing trade; shelled by Germans 1918.
**Ra'na,** genus of common frogs, **1375.**
**Rand** or **Witwatersrand,** gold mining dist. around Johannesburg, S. Africa, **3281.**
**Randall, James Ryder** (1839–1908). Amer. poet, b. Baltimore; author of 'Maryland, My Maryland'.
**Randall's Island,** N.Y., **2488.**
**Randers** (*rän'dērs*), Denmark, town in n. Jutland, 23 mi. s. of Aarhuus; pop. 23,000; glass and other mfrs.; exports grain, dairy products, wool; **996.**
**Randolph** (*răn'dŏlf*), **Edmund** (1753–1813). Amer. statesman, b. Williamsburg, Va.; gov. of Va. 1786–88; member Constitutional Convention (proposed "Virginia plan"), atty.-gen. and sec. of state under Washington.
**Randolph, John** (1773–1833) "of Roanoke," Amer. statesman, b. Cawsons, Va.; eloquent, sarcastic, and eccentric representative and senator from Va. between 1799 and 1827; duel with Clay, **785.**
**Randolph-Macon System of Colleges and Academies.** Group of schools in Virginia under auspices of Meth. Episc. church South; controlled by a single board of trustees; consists of college for men, college for women, two academies and an institute, Randolph-Macon College, parent institution at Ashland; men; founded 1830; removed from Boydton 1868; collegiate and graduate work. Randolph-Macon College for women at Lynchburg; founded 1893; collegiate, graduate, and music courses.
**Range,** in surveying, **1960.**
**Range'ley Lakes,** chain of connected lakes in w. Maine; neighborhood abounds in fish and game; **2128.**
**Ranger,** Tex. Oil town in n. center of state; pop. 16,205; oil field opened 1917, reached maximum production of 75,000 barrels per day 1919.
**'Ranger',** U.S. ship, **1900.**
**Rangoon** (*răn-gụṅ'*), chief port and mfg. center of Burma on Rangoon mouth of Irrawaddy R. near s. coast; pop. 295,000; exports rice, teak; **541.**
**Rank,** in U.S. Army, **218,** insignia, **3576;** in U.S. Navy, **2426,** insignia, **3577.**
**Ranke** (*räṅ'kē*), **Leopold von** (1795–1886). Ger. historian, founder of modern critical methods of historical study.
**Ran'kin, Jeannette** (born 1880), Amer. suffrage worker, b. Missoula, Mont.; congresswoman from Montana (1917–19); **3779.**
**Ranunculaceae** (*rȧ-nŭn-kū-lā'sĕ-ē*). Same as **Crowfoot family.**
**Rapallo** (*rä-päl'lō*), Italy. Small winter resort on Bay of Genoa 16 mi. e. of Genoa; treaties between Italy and Jugo-Slavia 1920, and Germany and Russia 1922, signed here.
**Rapallo, Treaty of,** between Italy and Jugo-Slavia (1920), settling disputed Adriatic territory, **1660, 1286.**
**Rapallo, Treaty of.** Signed 1922, between Germany and Russia; annulled treaty of Brest-Litovsk and restored diplomatic relations; cancelled indemnity claims and prewar debts.
**Rape,** plant grown for forage and oil, **1751.**
**'Rape of the Lock, The',** poem by Pope, **2879.**
**Raphael** (*răf'ā-ĕl*) **Santi** (1483–1520), one of the greatest of the Ital. painters, **2976, 2108;** fresco painting, **2629;** 'Madonna of the Chair', *picture,* **2109;** 'Sistine Madonna', *picture,* **2635;** tapestries for Sistine Chapel, **1201;** work in Vatican, **3054, 3055, 1902.**
**Raphael,** an angel, in Milton's 'Paradise Lost', **2245–6.**
**Rapier** (*rā'pĭ-ēr*), a sword, **3423,** *picture,* **3422.**
**Rappahan'nock,** r. of Virginia, source in Blue Ridge Mts.; flows s.e. to Chesapeake Bay; **3648,** *map,* **3650.**
**Raptores** (*răp-tō'rēz*), order of preying birds, **412, 3949,** *pictures,* **415;** eagles, **1053–5;** hawks and falcons, **1607;** owls, **2607;** vultures and buzzards, **3662, 550–1.**
**Rare earths, 2247, 1407.**
**Rar'itan River,** N.J., formed by two branches in n. of state; 75 mi. to Raritan Bay; *map,* **2458.**
**Ras'mussen, Knud** (born 1879), Danish Arctic explorer, b. in Greenland; several ethnological expeditions to Greenland; remarkable trip across Greenland 1912–14; route, *map,* **1540.**
**Raspberry, 2977.**
**Rasputin** (*rȧ-spụ'-tĭn*), **Gregory Efimovitch** (1871–1916), Rus. monk; uncouth peasant who deserted family for religious life 1904; gained vast influence through fanatical teachings and personal magnetism; intolerable interference in politics led to murder by Rus. nobles; influence on Nicholas II and czarina, **2506.**
**Ras'selas.** Prince of Abyssinia, in Samuel Johnson's philosophical romance of that name, seeker for happiness, at last disenchanted.
**Rastatt** (*rä'shtät*). Town in Baden, s. Germany; pop. 13,000; treaty between France and Austria 1714 ending War of Spanish Succession.
**Rat, 2977–8;** a rodent, **3036;** care of rat and mice pets, **2757;** evolutionary position, *diagram,* **128;** kangaroo rat, **1908;** "Pharaoh's rat," **1724.**
**Rat flea, 1292, 2678.**
**Rathenau** (*rä'tē-nou*), **Walter** (1867–1922). Ger. economist and industrialist; controller of raw materials during World War, and one of outstanding figures of German post-war industrial reconstruction; foreign minister 1922; assassinated June 1922.
**Ratio** (*rā'shĭ-ō*), in geometry, **1422.**
**Ra'tionalists,** in philosophy, **2772.**
**Ratisbon** (*rȧt'ĭs-bŏn*) or **Regensburg,** Germany, commercial and mfg. town in Bavaria on Danube R. 65 mi. n.e. of Munich; pop. 53,000; stormed by Napoleon 1809; once free imperial city; **961, 347, 1442.**
**Ratitae** (*rȧ-tī'tē*), subclass of birds without a "keel" breastbone, **2603, 3949.**
**Raton** (*rä-tōn'*), N.M., city in extreme n.; pop. 5544; industrial interests, **2467.**
**Rat snakes, 3260.**
**Rattan',** 343.
**Rattlesnake, 2978;** hibernation, **131;** a pit viper, **3646;** action of poison, **3260.**
**Rauch** (*rouĸ*), **Christian Daniel** (1777–1857). The greatest Ger. sculptor of his time; most famous works, the monument to Queen Louise at Charlottenburg and the bronze equestrian statue of Frederick the Great in Berlin.
**Raven,** a large crow-like bird, **2979;** length of life, **126.**

**'Raven, The'**, poem by E. A. Poe, **2849, 2979.**
**Raven'na,** Italy, old city of Italy noted for its churches; 75 mi. s. of Venice; pop. 75,000; **2979;** Dante's burial place, **958;** mosaic in Church of St. Vitale, *picture,* **2630.**
**Ravenna, battle of,** victory of French over united Spanish and papal armies in 1512, **2979.**
**Ravenna, Exarchate of,** territory ruled by Byzantine exarch or governor in Italy 6th–8th cents.; cap. Ravenna; conquered by Pepin and given to pope, **2979.**
**Ravensa'ra nut, 2546.**
**Rawlinson, Sir Henry Creswicke** (1810–95), Eng. soldier, diplomat, and orientalist; first successful decipherer of Persian cuneiform inscriptions; Behistun Rock, *picture,* **2739.**
**Ray, Cape,** s.w. point of Newfoundland, **3108.**
**Rayleigh** (*rā'lĭ*), **John William Strutt, Baron** (1842–1919), Brit. physicist, 1904 Nobel prize winner; discovery of argon, **50.**
**Raymond of Toulouse** (d. 1105), powerful count of Provence; a leader in First Crusade, **929.**
**Rays,** various primitive flattened fish, including the skates, **3244,** *picture,* **1272;** classed as Selachians, **3196;** egg, *picture,* **1091;** evolutionary position, **1271–2;** *diagram,* **128;** sawfish a type, **3131;** torpedo-fish, **3517.**
**Razor-billed auk, 259.**
**Razor shell, 3201.**
**Re,** Egyptian deity. *See in Index* **Ammon.**
**Ré** (*rā*). Fr. isl. in Bay of Biscay; 33 sq. mi.; mainly sand dunes; salt, oysters.
**Reaction turbine, 3554.**
**Read, Albert Cushing** (born 1887), U.S. naval officer who made first transatlantic flight, **63.**
**Read, Thomas Buchanan** (1822–72). Amer. poet and painter, b. Chester County, Pa. ('Sheridan's Ride'; 'House by the Sea').
**Reade, Charles** (1814–84), Eng. novelist and reformer; 'It's Never Too Late to Mend', directed at prison abuses; 'Foul Play', an attack on over-loading and over-insuring of ships; 'The Cloister and the Hearth', **2996.**
**Reading** (*rĕd'ĭng*), **Rufus Isaacs, first Earl of** (born 1860). Brit. jurist, first Jewish Lord Chief Justice of England (1913–21); special ambassador to U.S. 1918; appointed viceroy of India 1921.
**Reading,** England. City 36 mi. w. of London on Kennet R. near junction with Thames; pop. 95,000; biscuit mfrs., seed farms; cap. of Berkshire.
**Reading,** Pa., mfg. city 50 mi. n.w. of Philadelphia; pop. 107,784; **2983;** hat mfrs., **1597.**
**Reading, 2979–80;** how to judge books, **2980, 2542;** how to use the public library, **1991;** literature for children, **2027–30;** proper light for, **1715;** how to increase speed, **2980;** tests for measuring ability, **2980.** *See also in Index* **Literature; American Literature;** etc.
**'Reading',** a Little Talk by Arthur Mee, **2981–2.**
**'Reading from Homer',** by Alma-Tadema, *picture,* **3542.**
**Realgymnasium,** Ger. school, **3140.**
**Realism** in the fine arts; beginning of, in painting, **2630;** Velasquez, **3620;** Rodin, **3036.**
**Realism,** in literature. **2540, 2541;** Balzac, **323;** Hardy, **1582;** Howells, **1689;** Russian, **3097–8;** Tolstoy, **3512;** Zola, **3840.**
**Reamer,** a machine tool, **3514.**
**Reaping machines, 2983, 2095,** *picture,* **605;** for hemp, **1630,** *picture,* **1631.**
**Rear-admiral,** in U.S. Navy, **2426;** insignia, **3577.**
**"Rear-horse,"** a mantis, **2137.**
**Reason,** and emotions, **1144.** *See also in Index* **Mind.**
**Réaumur** (*rā-ō-mür'*), **René Antoine de** (1683–1757), Fr. physicist and naturalist; showed corals to be animals, not plants; discovered method of tinning iron; thermometer, **3487.**
**Rebec'ca.** A biblical character; wife of Isaac and mother of Esau and Jacob (Gen. xxiv).
**Rebecca.** Character in Scott's 'Ivanhoe'; beautiful Jewess, daughter of Isaac of York.
**Re'bek,** Arab musical instrument, **3646.**
**Rebellion, The Great.** *See in Index* **Civil War** (in England).
**Rebellion of 1837,** in Canada, **618;** in Lower Canada, **2673, 2947;** in Upper Canada, **2102.**
**Recall, 1779;** supersedes impeachment, **1741.**
**Récamier** (*rā-kä-myā'*). **Madame Julie** (1777–1849). French society leader, famed for beauty and intelligence; friend of Chateaubriand and Madame de Staël; opponent of Napoleon, who exiled her.
**Receiver,** in radio. *See in Index* **Radio-telegraphy and telephony.**
**Receiver,** telephone, **3458,** *picture,* **3459.**
**'Recessional, The',** by Kipling, **1927.**
**Recife** (*rā-kē'fā*), Brazil. Same as **Pernambuco.**
**Recip'rocating engine, 3554.**
**Reciprocating saw, 2082.**
**Reciprocity** (*rĕs-ĭ-prŏs'ĭ-tĭ*), between U.S. and Canada; arranged by treaty 1854, abrogated by U.S. 1866; its renewal proposed and rejected by Canada 1891; proposed by U.S. 1911 but defeated in Canadian elections, **1971, 620, 466.**
**Recitative** (*rĕs-i-ta-tēv'*), musical recitation, **2584.**
**Reclama'tion.** *See in Index* **Irrigation and reclamation.**
**Reclamation Service,** U.S., **1829, 3600;** at Denver, **998.**
**Reclus** (*rē-klü'*), **Jean Jacques Elisée** (1830–1905). Fr. geographer; remarkable scientific knowledge and literary style ('The Earth and Its Inhabitants').
**Reconstruction,** in U.S. (1865–77), **780, 3605;** contest between Johnson and Congress, **1897–8;** in Ga., **1434;** in La., **2072;** Lee's part, **1984;** in S.C., **3292;** in Tenn., **3469;** U.S. troops removed from South, **1611;** post-reconstruction development, **223.**
**Record,** phonograph, **2774, 2776, 816.**
**Rectangle,** in geometry, **1425.**
**Reculet** (*rē-kü-lā'*), **Mt.,** highest point of the Jura Mts.; 5643 ft.; **1903.**
**Red,** a primary color, **837;** in spectrum, **3311, 3312.**
**Red adder,** or copperhead, **884.**
**Red-bird,** a cardinal, **642–3.**
**Redbreast, 3028.**
**Red-breasted sapsucker, 3781.**
**Red-bud tree, 1901.**
**Red bunting, 534.**
**Red cedar, 1903;** used for pencils, **2712.**
**Red Cloud** (1822–1909). Sioux Indian chief, leader in massacre (1866) near Ft. Phil Kearny, Wyo., of Capt. Fetterman and 100 troops; signed peace with U.S. 1880.
**Red clover, 809, 810.**
**Red coral, 884, 886.**
**Red corpuscles,** in blood, **437.**
**Red Crescent Society, 2986.**
**Red Cross societies, 2983–6;** Clara Barton, **337–8.**
**Red currant, 940.**
**Red deer, 980, 3669.**
**Red dog,** a grade of flour, **1303.**
**Red Eagle, Order of the, 979.**
**Red elm, 1138–9.**
**Red-eyed vireo, 3647,** *picture,* **419.**
**Redfish, 1279.**
**Red fox, 1337.**
**Redhead,** a sea-duck, **1046.**
**Red-headed woodpecker, 3781,** *picture,* **3780.**
**Red Jacket** (1750?–1830). Last great chief of Seneca Indians; served with British in Rev. War, with U.S. in War of 1812.
**Red Lake,** in n. Minnesota; 35 mi. long; *map,* **2254.**
**Redlands,** Calif. City in s. of state 65 mi. e. of Los Angeles in fruit-growing section; pop. 9571; one of largest orange-shipping centers of world; also ships lemons, grapefruit, and olive oil; U. of Redlands.
**Red lead,** an ingredient of mineral paint, **1973, 2642.**
**Red'manol,** an artificial plastic material, **673, 816.**
**Red maple, 2138.**
**Redmond, John Edward** (1851–1918), Irish parliamentary leader who secured passage of Home Rule bill of 1914, **1811.**
**Red Mountain,** Ala., **426.**
**Red oak, 2547, 2548.**
**Red pepper, 2723.**
**Red Pine, 2808.**
**Red Polled cattle,** a beef breed, **663.**
**Red race, 2956, 2881.**
**Red raspberry, 2977.**
**Red River,** the southernmost of the great tributaries of the Mississippi; rises in Staked Plains of Texas; 1200 mi. long; *maps,* **3478, 2070;** in La., **2068;** in Okla., **2574, 2576;** in Tex., **3476.**
**Red River of the North,** r. rising in Minnesota and flowing 700 mi. n. to L. Winnipeg, **2986;** valley in Manitoba, **2136;** in Minn., **2253;** in N.D., **2522, 2524.**
**Red River Settlement,** colony established near present city of Winnipeg in 1812 by Lork Selkirk, member Hudson's Bay Co.; rebellion (1869–70), **2986, 2137, 3129, 3369.**
**Red Sandrock Hills,** Vt., **3632.**
**Red scale, 3133.**
**Red Sea,** arm of Indian Ocean between Arabia and Africa connected with Mediterranean by Suez Canal; 1200 mi. long; **2986,** *map,* **232–3;** redness caused by algae, **2822;** Suez Canal, **3384.**
**Red-shouldered hawk, 1606,** *pictures,* **1606, 1607.**
**Red squirrel, 3334;** how it hibernates, **1646.**
**Redstart,** a warbler, **3669.**
**Red Sulphur Springs,** W. Va., **3720.**
**Red-tailed hawk, 1606.**
**"Reductio ad absurdum,"** a method of proof in geometry, **1427.**
**Red viper,** or copperhead, **884.**
**Redwinged blackbird, 432, 433;** *picture,* **417.**
**Redwood,** a giant tree, **3175–6, 2082;** distinguished from other conifers, **3539.**
**Reed, Ezekiel** (18th cent.), Amer. inventor; first nail-making machine, **2388.**
**Reed, Thomas B.** (1839–1902). Amer. statesman, b. Portland, Me., congressman from Maine 1876–99, Republican leader and Speaker of House 1889–91 and 1895–99; called "Czar" Reed because of his stringent rulings (continued as permanent rules of procedure) to increase efficiency of House.
**Reed, Walter** (1851–1902), Amer. army surgeon and bacteriologist, b. Gloucester County, Va.; discovers cause of yellow fever, **2335–6, 2653.**
**Reedbuck,** an African antelope, **146.**
**Reed College.** At Portland, Ore.; co-ed., nonsectarian; founded 1910; liberal arts.
**Reed instruments, 2383.**
**Reed organ, 2600.**
**Reeds,** various tall hollow-stemmed grasses, **1502, 3700;** used for pens, **2709, 2710.**

**Reefs, coral,** 886; atolls of Pacific, 2621; Great Barrier, 262, *picture,* 885; Florida Keys, 1921; in Red Sea, 2986.
**Referee',** in football, 1326.
**Referen'dum,** 1778–9.
**Refining,** of metals. *See in Index* **Metallurgy.**
**Refining,** of petroleum, 2753–4.
**Reflecting telescope** or **reflector,** 3462–3.
**Reflec'tion,** of light, 2000; of sound, 3278, 1073–4.
**Reform Acts,** in England: (of 1832), 2688; opposed by Peel, 2706; Russell champions, 3083; Whigs secure passage, 2869; opposed by Wellington, 3717; (of 1867, 1884–5), 2688, 1013; (of 1918), 3779.
**Reforma'tion, Protestant,** 2987–9, 2084–5; Counter Reformation, 2989, 764, 2075, 2813; Huss a forerunner, 1705; in Netherlands, 3741, 2763, 2916; reforming councils, 763–4; Renaissance a contributing factor, 2996; in Scotland, 1941, 3148; in Switzerland, 3842, 587, 3414; in Wales, 3664; Wyclif's influence, 3817.
*In England,* 2988, 1154; Henry VIII begins, 1636;. More opposes, 2325; under Edward VI, 1089; reaction under Mary, 2157; Elizabeth supports, 1136, 1137; Puritans, 2937; Stuarts and Puritan Revolution, 1860–1, 691–3, 924–5; King James Bible, 389; reflected in literature, 1164, 1165. *See also in Indcx* **England, Church of.**
*In France,* 1352, 1696, 826. *See also in Index* **Huguenots.**
*In Germany,* 1448; Luther begins, 2084–5; and Charles V, 691, 1354; Thirty Years' War, 3488. *See also in Index* **Thirty Years' War.**
**Refracting telescope,** 3462–3.
**Refrac'tion,** of light, 2000, *pictures,* 1999; law of, 1987; by lenses, 1986–8; by prisms, 3311; rainbows, 2972.
**Refrain'** or **return,** in poetry, 2850.
**Refrigera'tion,** 2989–92; cold storage, 825; cork used for insulation, 888; develops fruit industry, 1377–8; freezing mixtures, 1362.
**Refrigerator car,** 2989–90.
**Re'gan,** one of King Lear's two cruel daughters, in Shakespeare's tragedy, 1926.
**Regeneration of lost parts,** the renewal or replacement of parts or organs of living animals; of antlers, 1680; human skin, 3246; hydra, 1707–8; lizard's tail, 2036; snail's eyes, 3255; snake skin, 3257; spider legs, 3325; tapeworm, 3814.
**Regenerative furnace,** 1826.
**Regensburg** (*rā'gĕnz-bŭrĸ*). Germany. Same as **Ratisbon.**
**Regent** (*rē'jĕnt*) or **Pitt diamond,** 1005.
**Regent's Park,** London, 2055.
**Regent Street,** London, a famous mile-long street laid out 1813 to connect the Prince Regent's (George IV) residence with Regent's Park, 2055.
**Reger, Max** (1873–1916). Ger. composer, whose austere, classical polyphonic forms gave him a position among recent composers similar to Brahms' in an earlier day; unlike Brahms, he could write nothing simple; probably greatest composer for organ since Bach; wrote 300 songs and numerous orchestral and choral pieces.
**Reggio di Calabria** (*rĕj'ō dē kä-lä'brī-ä*), seaport of s. Italy on Strait of Messina; pop. 43,000; silk, perfume, olive oil mfrs.; earthquakes 1783, 1908; ancient Gk. city Regium; Apennine Mts., 154; mirages, 2261.
**Reggio nell' Emilia** (*nĕl ā-mē'lē-ä*). Commercial and mfg. city in n. Italy 90 mi. n.e. of Genoa on branch of Po R.; pop. 75,000; cathedral, works of art.
**Regicides** (*rĕj'ĭ-sīdz*), in Eng. history, those persons directly responsible for execution of Charles I; especially the 67 members of High Court of Justice who voted for the death penalty; Judges' Cave, 2456.
**Regillus** (*rē-jĭl'ŭs*), ancient lake near Rome, now disappeared; battle of, 3042.
**Reg'iment,** in U.S. Army, 218.
**Regin** (*rā'yin*), in Norse and Ger. myth., dwarf smith who rears Siegfried, 3230–1.
**Regina** (*rē-jī'nà*), cap. of Saskatchewan; pop. 40,000; railroad and trade center, 2992.
**Registered mail,** 2894.
**Registered stocks and bonds,** 3359.
**Regular clergy,** 764.
**Regular verbs,** 3628.
**Regulus** (*rĕg'yų-lŭs*), **Marcus Atilius** (3d cent. B.C.), Rom. general and consul in first Punic War, 754, 1915.
**Regulus,** a star, 3342.
**Re'han, Ada** (1860–1916). Amer. actress, b. Limerick, Ireland; as leading lady for Augustin Daly and later as star, won high rank both in high comedy and farce (Rosalind in 'As You Like It'; Katherine in 'Taming of the Shrew').
**Rehobo'am** (953?–937? B.C.), king of Israel, 1890.
**Reichenbach** (*rī'ĸĕn-bäĸ*). Town in e. Germany 30 mi. s.w. of Breslau; pop. 27,000; Prussian victory over Austrians 1762; convention 1790 guaranteeing integrity of Turkey; alliance against Napoleon 1813.
**Reichenberg** (*rī'ĸĕn-bĕrĸ*) or **Liberac,** Czecho-Slovakia. City 55 mi. n.e. of Prague; pop. 36,000; important cloth mfrs.
**Reicher** (*rīĸ'ĕr*), **Emanuel** (born 1849). Ger. actor, considered foremost interpreter of Ibsen, Strindberg, and Björnson; first appearance in America 1915.
**Reichstadt** (*rīĸ'shtät*), **Duke of,** title given by European powers to Napoleon II (1811–32), son of Napoleon and Marie Louise; called L'Aiglon ("little eagle"); 2396.
**Reichstag** (*rīĸs'täĸ*), German legislative assembly, 1449, 1445; building, *picture,* 385; Baden's representation, 303; dominated by Prussia, 2929.
**Reid** (*rēd*), **(Thomas) Mayne** (1818–83). Irish writer of tales of adventure and hunting romances; lived in U.S. 1840–49, traded with Indians, fought in Mexican War ('Scalp Hunters'; 'White Chief'; 'The Rifle Rangers'; 'The Boy Tar'; 'Afloat in the Forest').
**Reid, Thomas** (1710–96). Scotch philosopher ('Inquiry into the Human Mind', etc.); distinguished for his assertion of certain irresistible convictions which are due to intuitions.
**Reid, Whitelaw** (1837–1912). Amer. journalist and diplomat; editor and principal owner of New York *Tribune* succeeding Horace Greeley; ambassador to France (1889–92) and to Gt. Brit. (1905–12).
**Reign of Terror,** in Fr. history, 1370; in Bordeaux, 466; Danton, 961; executions, 2682, 2067, 2148, 3039, 1249; Rochambeau, 3033; Robespierre's share, 3027.
**Reims** (*rēms,* Fr. *răⁿs*), France, city in n.e. France, 100 mi. from Paris; pop. 115,000; 2992–3; coronation of Charles VII, *picture,* 695; in World War, 3792, 2992–3.
**Reincarna'tion,** or transmigration of soul, Buddhist teachings, 525.
**Reindeer,** 2993, *pictures,* 76, 3085; in Alaska, 77, 78; in Canada, 1970; caribou of N. Amer., 644; females have antlers, 979; importance to the Lapps, 1962.
**Reindeer Lake,** Canada, 3128, *map,* 602–3.
**Reindeer moss,** a lichen most abundant in arctic and subarctic regions; large starch content; 1994.
**Reindeer Mts.** Same as **Caribou Mts.**
**Reinecke Fuchs.** *See in Index* **Reynard the Fox.**
**Reinforced concrete,** 531, *picture,* 530.
**Reinhardt** (*rīn'härt*), **Max** (born 1873), Ger. theatrical director, whose chief aim was to bring the audience into the action of a play, side by side, as it were, with the actors; 3485.
**Reis, Johann P.,** Ger. inventor, 3458.
**Réjane,** (*rā-zhän'*) **Gabrielle** (1857–1920). Fr. emotional actress, in whom "essence of French vivacity and animated expression appeared to be concentrated"; "Madame Sans Gêne" and "Zaza" made her as great a favorite in England and America as she had been in France.
**Relativ'ity.** Basal theory of physics formulated 1905–15 by Albert Einstein and founded on the principle that absolute motion through space cannot be detected by any physical experiments; involves radical revisions of our ideas of space and time; partly verified by observation of (1) distortion of oval orbits of planets around the sun, and (2) deviation of light rays in a gravitational field.
**Relay,** in telegraphy, 3456.
**Relief,** in sculpture, 3154.
**'Religio Medici'.** ("Religion of a physician"), contemplative soliloquy and religious treatise written by Sir Thomas Browne, 1165.
**Religions of the world,** 2993–4; animal worship, 2386, 1106, 2369, 525, 3259, 816, 2291–2; Asiatic origin, 232; Aztec, 290; Buddhism, 524–5, 1864; Christianity, 763–4, 1887–8, 2698; Confucianism, 858, 2993–4; denominations in U.S. compared, *graph,* 3583; fetishism, 2120; fire-worship, 1249, 1250, 3841; anc. Greek, 1558, 2385; Hinduism, 1651, 1748, 486; influence on sculpture, 3155; influence on drama, 1031, 1033; Jainism, 525; relation to magic, 2117, 2120; Mohammedanism, 2275–8; Mormonism, 2326–7; mythology, 2385–6; nature worship, 2385–6, 1106, 1651, 1669, 1446, 2774; spiritualism, 3327, 1718; sun worship, 1250, 1106, 3392, 1868, 3841; tree worship, 3534, 674; Zoroastrianism, 3841–2. *See also in Indcx* chief religions and sects by name.
**Religious orders,** monks, friars, nuns, 2298–2302. *See also in Index* chief orders by name, as **Franciscans, Jesuits,** etc.
**Rembrandt** (*rĕm'bränt*) **Harmenszoon Van Rijn** (1606–69), Dutch painter, 2994–5, 2631; compared to Frans Hals, 1566; portrait by, *picture,* 2639.
**Remington, Frederic** (1861–1909), Amer. illustrator, painter, and sculptor of western plains life, b. Canton, N.Y. ('The Last Stand'; 'Conjuring the Buffalo Back'; etc.), 2634.
**Remington rifle,** 1254.
**Rem'sen, Ira** (born 1846). Amer. chemist, discoverer of saccharin, pres. of Johns Hopkins Univ. 1901–12; founder and editor of *American Chemical Journal;* author of 'Inorganic Chemistry' and several other books.
**Remus** (*rē'mŭs*), twin brother of Romulus, mythical founder of Rome, 3058.
**Remus, Uncle.** In Joel Chandler Harris' 'Uncle Remus's Tales', old plantation negro with a fund of negro songs and stories.
**Renaissance** (*rĕn-ā-säns'*), 2995–7; architecture, 188, *pictures,* 187, 470, 1200, 1849; effect of Crusades, 932; Dante, 957–8; drama, 1034;

Dürer, **1048–9**; in England, **1635, 1164, 2325**; influence of Florence, **1293–4**; in France, **1354**; furniture-making, **1384**; Ghiberti, **1456**; Ital. literature affected, **1833**; Julius II, **1902**; Leo X, **1988**; Medici, **2191**; Michelangelo, **2220–2**; painting, **2628–30**; philosophy influenced, **2773**; Pius II, **2813**; Raphael, **2976–7**; Rubens, **3076**; Savonarola, **3130**; sculpture, **3156–8**; Leonardo da Vinci, **3643–4.**

**Renan** (*rē-nän'*), **Ernest** (1823–92), Fr. author, philosopher, religious historian, and biblical critic; studied for Catholic priesthood, but became exponent of skepticism; **1365.**

**Rendering,** of oils, **1227.**

**Re'ni, Guido.** *See in Index* **Guido Reni.**

**Rennenkampf** (*rĕn'ĕn-kämpf*), **Paul Charles von** (1854–1918), Rus. general, commander cavalry division in Russo-Japanese War, participated in invasion of E. Prussia (1914); removed and dismissed from the service upon failure to prevent German capture of Warsaw; killed by the Bolsheviks; **3794.**

**Rennes** (*rĕn*), mfg. city 190 mi. w. of Paris on Vilaine and Ille rivers; pop. 80,000; cathedral, univ.; **515.**

**Ren'net, 709.**

**Ren'nin,** casein-digesting enzyme of gastric juice, **1010, 1011, 1173.**

**Re'no,** Nev., largest city in state, 25 mi. n. of Carson City; pop. 12,016; state univ.; **2445.**

**Renoir** (*rē-nwär'*), **Auguste** (1841–1919), Fr. painter, a leading impressionist, **2633.**

**Rensselaer** (*rĕn'sĕ-lēr*), N.Y. City on Hudson R. opposite Albany; pop. 10,823; felt, chemicals, dyes, medicines, lumber products.

**Rensselaer Polytechnic Institute,** at Troy, N.Y.; men; founded 1824, opened 1825; science, civil engineering; **3545.**

**Rent, 1077.**

**Replev'in.** A legal action enabling a person to regain possession of goods or chattels unlawfully held; the court issues a writ compelling the return of property and the owner gives a bond to try the case and comply with judgment.

**Repplier** (*rĕp'lēr*), **Agnes** (born 1858). Amer. essayist ('Books and Men'; 'The Fireside Sphinx').

**Represen'tatives, House of,** U.S., **860–2, 3593–4**; impeachment, **1740, 2914.** *See also in Index* **Congress.**

**Reproduc'tion,** of living organisms, **394, 395, 3936–7**; cells the reproducing units, **671–2**; embryology, **1140–1**; heredity, **1641–4.** —*Of plants:* algae, **90–2**; alternation of generations, **3173**; bacteria, **303**; caprification of figs, **1237,** *picture,* **1238**; ferns, **1232, 1234**; flowering plants, **1306–11, 2822**; grasses, **1503**; liverworts, **2032**; mosses, **2338–9**; mushrooms, **2374**; by seeds and spores, **3171–3**; water-plants, **3700**; yeast, **3828.** —*Of animals:* amoeba, **119**; birds, **404–8**; corals, **886**; by eggs (oviparous), **1090**; fish, **1275, 1089, 3165, 3357**; frogs, **1373–4**; insects, **1785–6, 660–1, 1964, 2936, 154, 360–2**; jellyfish, **1884**; kangaroo, **1908**; by living young (viviparous), **1090**; mammals, **2132**; rate connected with longevity, **127**; reptiles, **3261, 3562, 2038, 98**; toads, **3507.**

**Rep'tiles,** **2997**; *Study Outline,* **3948–9**; alligators, **98–9**; crocodiles, **922–3**; eggs, **1090**; evolution, **1209, 2038, 130,** *diagram,* **128**; first appear in Carboniferous time, **1418**; lizards, **2035–8**; parent form of birds, **400, 401, 1229**; prehistoric, **132–8, 1420**; results of being cold-blooded, **401**; snakes, **3257–61**; turtles and tortoises, **3562–3, 3520**; vertebrate structure, **3634.**

**Reptiles, Age of, 132–8, 1420.**

**Repub'lican party,** U.S., **2870, 2871**; origin and early leaders, **2012, 3182, 435, 3772**; reconstruction policies, **780**; twice elects Grant, **1499**; Hayes-Tilden election dispute, **1610–1**; quarrels with Hayes, **1611**; candidates and policies (1880–1900), **222, 223, 790, 1398–9, 1592, 2104**; under Roosevelt's leadership, **3060, 3062, 3428**; Progressive split, **3062, 3429, 3744, 3746**; in 1916 election, **3747**; return to power (1921), **1580, 1582, 3749**; tariff policy, **3437.** *See also* names of presidents.

**Republican party (Jeffersonian),** also called Democratic-Republican, **2870**; Jefferson's leadership, **1569, 1883**; policies, **1880, 1882, 3604, 3678**; relations with John Quincy Adams, **15.**

**Republican River,** rises in n.e. Colorado and flows 500 mi. e. and s.e. across s. Nebraska and n. Kansas to Kansas R.; *maps,* **2429, 1910**; irrigation, **2430.**

**Repul'sion, electrical, 1110, 1117–8.**

**Resaca de la Palma** (*rā-sä'kä dā lä päl'mä*), place in s. tip of Texas near Matamoras where Taylor defeated Mexicans 1846, **2207.**

**Res'ervoir.** *See in Index* **Dam; Waterworks.**

**Resht** (*rĕsht*). Chief silk-making and exporting town of Persia near Caspian Sea; pop. 40,000.

**Resid'ual soils, 3273.**

**Res'ins,** **2997**; amber, **106**; distinguished from gums, **1552**; kauri, **2499**; in laundry soaps, **3267**; in varnish, **2643, 3619.**

**Resis'tance, electrical,** measured in ohms, **1116.**

**Resistance welding, 3716.**

**Resolu'tion of 1798,** in U.S. history, **3347, 14.**

**Respira'tion** or **breathing,** **2998–9**; artificially induced, **1268–9**; in caterpillars, **660–1**; correct breathing, **1714**; effected by diaphragm, **1005**; fishes, **1274, 2364**; insects, **1787**; lungs, **2033**; plants, **2824–5, 1980**; in sleep, **3251**; snails, **3256**; sponges, **3329–30**; water-plants, **3700**; whales, **3723–4.**

**Restigouche** (*rĕs-tĭ-go͝osh'*). A river 225 mi. long forming part of boundary between New Brunswick and Quebec; flows into Bay of Chaleur; famous salmon and trout stream.

**Restora'tion,** in England (1660–88), **694**; effect on literature, **1165**; reflected in drama, **1036.**

**Resump'tion of specie payments,** in U.S. (1879), **3606, 1611**; urged by Grant, **1499.**

**Resurrec'tion, The, 1888.**

**Resurrection plant,** or rose-of-Jericho, **554.**

**Reszke** (*rĕsh'kā*), **Jean de** (born 1850). Polish operatic tenor, the greatest of his time; brother of the dramatic basso, Edouard de Reszke (1856–1917).

**Réthonde** (*rā-tôn̈d'*). A Fr. village 5 mi. e. of Compiègne where the Germans signed the armistice ending the World War.

**Ret'ina,** inner layer of the eyeball, **1213, 1214,** *picture,* **1216.**

**Retort' furnace, 1382.**

**Retrie'ver, 1022.**

**Retting,** of hemp, **1630,** *picture,* **1631.**

**Reuben** (*ro͞o'bĕn*). Eldest son of Jacob, ancestor of the tribe of Reuben.

**Reuchlin** (*roiĸ'lĭn*), **Johann** (1455–1522), Ger. scholar, pioneer of the "new learning" and father of study of Hebrew and Greek in Germany; made famous and successful struggle against bigots who wished to burn or confiscate all Jewish books except Bible; **2987.**

**Réunion** (*rā-ü-nĭ-ôn'*) (formerly Bourbon). Volcanic isl. and Fr. colony in Indian Ocean 400 mi. e. of Madagascar; 970 sq. mi.; pop. 174,000; sugar, rum, coffee, vanilla, spices.

**Reuss** (*rois*). A dist. of the republic of Thuringia, Germany; 441 sq. mi.; pop. 212,000; formerly two separate principalities, Reuss-Greiz and Reuss-Schleiz-Gera.

**Reuter** (*roi'tĕr*), **Paul Julius, Baron von** (1821–99). Ger.-Eng. capitalist; founder of famous world-wide news-collecting service (1849).

**Reval** (*rā'väl*) or **Tallinn,** cap. of Esthonia on Gulf of Finland; pop. 160,000; Hanse town; taken by Germans 1918; **1180.**

**Revela'tion, Book of** or **Apocalypse.** The 27th and last book of the New Testament; date and authorship disputed, but generally attributed to Apostle John.

**Rev'enue.** *See in Index* **Taxation.**

**Revenue, internal, 3441**; Bureau of, **3598.**

**Revenue Cutter Service,** U.S., **3598, 1995.**

**Reverbera'tion,** reflection of sound as echo, **3278, 1073.**

**Reverberatory furnace,** furnace with vaulted ceiling that deflects flame and heat, **1382, 1824,** *picture,* **883.**

**Revere** (*rē-vēr'*), **Paul** (1735–1818), Amer. Rev. patriot, **2999–3000, 1990, 3454**; home, **472,** *picture,* **471.**

**Revere,** Mass., suburb of Boston on the n.c.; pop. 28,823; named for Paul Revere; **472.**

**Reversing Falls,** at St. Johns, New Brunswick, **3107,** *picture,* **609.**

**Rever'sion to type,** return of domesticated plant or animal to ancestral type; of goldfish, **1483, 1277**; of pigeon, **2804.**

**Revised Version of the Bible, 390.**

**Revi'val of Learning.** *See in Index* **Renaissance.**

**Revolution, American, 3000–4**; chief events summarized, **1664–5**; Arnold's treason, **219–20, 123**; colonial flags, **1287–8**; Continental Congress, **3593, 3003**; Declaration of Independence, **975–6**; diplomacy, **1358, 3003, 1880, 13**; finances, **2328, 2329, 2282**; firearms, **1254**; French aid, **3003, 1956, 1367**; Indians aid British, **1772**; Loyalist emigration, **617, 2583**; political parties in, **2869**; treaty of peace, **3004, 3633**; uniform, **3578.**

*Causes and preliminary events,* **3000–2**; Burke opposes Eng. policies, **540**; Chatham upholds colonists, **700**; *Gaspee* burned, **3010**; attitude of George III, **1428, 1430**; Hancock, **1570–1**; Stamp Act, **3337–8, 1358.**

*Military events,* **3002–4**; Lexington and Concord, **1990**; capture of Ticonderoga, **98**; Bunker Hill, **533–4**; battle of Long Island, **2061**; Hessians defeated at Trenton, **3540**; Burgoyne's surrender, **3126, 219, 1409**; Valley Forge, **3615, 3355**; Old Northwest conquered by Clark, **783**; importance of West Point, **2238.** —*Southern campaign,* **1539, 3292, 2149**; battle of Kings Mt., **3292, 3181**; Camden, **987, 1409**; Yorktown, **3831.**

*Leaders:* John Adams, **13**; De Kalb, **987**; Franklin, **1358**; Gates, **1408–9**; Greene, **1539**; Alexander Hamilton, **1568**; John Hancock, **1570–1**; Patrick Henry, **1638**; John Jay, **1879–80**; John Paul Jones, **1900–1**; Kosciusko, **1944**; Lafayette, **1956**; Francis Marion, **2149**; Robert Morris, **2328–9**; James Otis, **2604**; Thomas Paine, **2626**; Pulaski, **2933**; Israel Putnam, **2939**; Rochambeau, **3033**; Steuben, **3355**; Washington, **3676–7**; Anthony Wayne, **3706–7.** *See also in Index* principal events and leaders by name.

**Revolution, French.** *See in Index* **French Revolution.**

**Revolution, Russian.** *See in Index* **Russia.**

**Revolution of 1688,** in England, **1861.**
**Revolution of 1830,** in Europe, **1196;** in Belgium, **376;** in France, **1353, 696, 1957, 2067;** in Italy, **1837, 2178;** in Poland, **2859.**
**Revolution of 1848,** in Europe, **1196;** in France, **2067;** in Germany, **3737, 2929, 1448, 3772;** in Hungary, **1944–5, 1703, 1354, 2505;** in Italy, **1837, 3638, 1354, 2178, 1399, 3625.**
**Revol'ver,** small firearm with revolving chambered cylinder, **1256;** invented by Colt, **1254;** *picture,* **1253.**
**Reykjavik** (*rā-kyä-vēk'*) cap. and largest city of Iceland on s.w. coast; pop. 15,000; univ.; port icebound in winter; *picture,* **1723.**
**'Rey'nard the Fox',** old beast-epic, story, **1337–8.**
**Reyn'olds, Sir Joshua** (1723–92), Eng. portrait painter; ranks with Gainsborough among great Eng. masters; most successful and fashionable in his day ('Mrs. Siddons as the Tragic Muse'; 'Johnson'; 'Burke'—portraits that are "historic monuments as well as sympathetic works of art"); **2631;** association with Dr. Johnson, **1166, 1899.**
**Rezonville** (*rē-zôn-vēl'*), village in France, scene of battle in Franco-Prussian War (also called battle of Gravelotte), *picture,* **1352.**
**Rhadamanthus** (*răd-ă-măn'thŭs*), In Gk. myth., brother of Minos, king of Crete, made with him judge in underworld because of his "Rhadamanthine" inflexibility.
**Rhadames,** Tripoli. Same as **Ghadames.**
**Rhea** (*rē'ȧ*), in Gk. myth., sister and wife of Kronos, and mother of the chief gods, **3607.**
**Rhea,** a S. American ostrich, **2603.**
**Rhea Silvia,** in Rom. myth., vestal, mother of Romulus and Remus, **3058.**
**Rheims,** France. Same as **Reims.**
**Rheinfels,** (*rīn'fĕls*), Ger. castle 13 mi. s. of Coblenz; built 13th cent.; **3005.**
**Rhein'stein,** castle 17 mi. w. of Mainz, Germany; owned by Prince Henry of Prussia; **3005.**
**Rhen'ish Palat'inate.** *See in Index* **Palatinate.**
**Rhe'ostat,** device with switch to various resistances for controlling amount of electric current; in motion-picture projector, *picture,* **2353;** in street cars, **3371.**
**Rhe'sus monkey,** *picture,* **2288.**
**Rhetoric** (*rĕt'ô-rĭk*), **3004–5;** Aristotle, **196;** figures of speech, **1238–9;** Gk. orators, **1537.**
**Rheumatism** (*rụ'mȧ-tĭzm*), inflammatory disease attacking joints, muscles, or heart, either in acute or chronic form, **1452, 3454.**
**Rhine** (*rīn*), river of w. Europe, rising in Swiss Alps and flowing 850 mi. n. to North Sea, free to shipping of the world by Treaty of Versailles; **3005–6, 3413–4, 1439,** *maps,* **3415, 1440, 373, 1196–7,** *pictures,* **1446, 3005, 3420;** canal to Danube R., **961;** chief cities on, **833–4, 3068, 3006;** delta in Holland, **2438;** now Fr. boundary, **1346;** "loess" soils, **3273;** timber rafts, **1442.**
**Rhine Province, Rhenish Prussia,** or **Rhineland,** most w. province of Prussia, bounded on w. by Holland, Belgium, and Luxemburg; 9470 sq. mi.; pop. 6,770,000; chief Ger. mineral dist.; cap. Coblenz; chief city, Cologne; **1441.**
**Rhinoceros** (*rī-nŏs'ĕ-rŏs*), **3006–7;** attacked by ants, *picture,* **142;** classification, **3434;** fossil types, **138;** horns, **1680;** prehistoric type, *picture,* **667;** related to horse and tapir, **3434, 1336.**
**Rhinoceros beetle,** **371,** *picture,* **367;** method of defense, **1785.**
**Rhinoceros iguana,** **1729,** *picture,* **2036.**
**Rhi'zoid,** a rootlet used for attachment in primitive plants; in liverworts, **2032.**
**Rhi'zopods,** class of unicellular animals with "false feet" (pseudopods), **3944.**
**Rhode Island,** New England state, smallest in U.S.; 1248 sq. mi.; pop. 604,397; **3007–10,** *map,* **3009;** cap. Providence, **2927–8;** clipper ships, **2927;** first cotton mill, **1218;** history and government, **3008–10;** industries and products, **3007–8, 3010;** meaning of name, **3347;** slave trade, **2927;** state flower, **3347;** Roger Williams, **3742.**
**Rhode Island Red,** a breed of fowls, **2911,** *picture,* **2909.**
**Rhodes** (*rōdz*), **Cecil John** (1853–1902), Brit. S. African financier and statesman, **3011–2, 3282;** on Mexico's wealth, **2211.**
**Rhodes,** Gk. isl., easternmost of Aegean Isls.; 565 sq. mi.; pop. 30,000; **3010–1,** *map,* **1518.**
**Rhodes, Colossus of,** **3010, 3178,** *picture,* **3179.**
**Rhodesia** (*rō-dē'zĭ-ȧ*), Brit. protectorate in S. Africa n. of Transvaal; administered by British South Africa Co.; 440,000 sq. mi.; pop. 1,740,000; divided into N. and S. Rhodesia by Zambezi R.; *map,* **3282;** named for Cecil Rhodes, **3011;** products, **3283;** Zambezi R., **3837;** Victoria Falls, **3640–1.**
**Rhodes Scholarships,** **3011–2.**
**Rho'dium,** a grayish metallic element, **4042.**
**Rhododen'dron,** a flowering shrub, **3012,** *picture,* **1304;** on Himalayas, **1748;** poisonous to live stock, **2854;** pollen grain, *picture,* **1309.**
**Rhodope** (*rŏd'ō-pē*) **Mts.** A southern arm of the Balkans in Macedonia and Thrace; highest point 9600 ft.
**Rhondda, David Alfred Thomas, Viscount** (1856–1918). Brit. food controller in the World War; for 22 years member of Parliament; made immense fortune from coal mines.
**Rhone** (*rōn*), a r. of Europe rising in Swiss Alps and flowing through s.e. France 500 mi. to Mediterranean, **3012, 1344, 1345;** delta, growth of, **2791;** at Avignon, *picture,* **1349;** at Geneva, **1411;** source, **3414.**
**Rhu'barb,** an edible plant, **3012–3;** contains vitamins, **3652;** when and how to plant, **1397.**
**Rhyme** (*rīm*), **2850.**
**Rhythm** (*rĭthm*), in music, **2378;** in poetry, **2850.**
**Rial'to,** bridge in Venice, **3624.**
**Ribaut** (*rē-bō'*) or **Ribault, Jean** (1520–65), Fr. Huguenot navigator; as agent of Coligny established Protestant colonies near Port Royal, S.C. (1562) and at Ft. Carolina, Fla. (1564); slaughtered, with most of his men, by Menendez; **1295,** *map,* **1297.**
**Ribbon-fish,** any of various deep-sea forms with long ribbon-like bodies; oar-fish, an example, **1276.**
**Ribbon seal,** **3167.**
**Ribera** (*rē-bā'rä*), **Giuseppe** (1588–1656). Span. painter; a leader of Neapolitan school in Italy; called Lo Spagnoletto, "Little Spaniard."
**Ribs,** in human skeleton, **3245,** *picture,* **3244;** of snakes, **3257.**
**Ricardo** (*rĭ-kär'dō*), **David** (1772–1823), Eng. (Jewish) political economist ('Principles of Political Economy and Taxation'), **1078.**
**Riccio** (*rēt'chō*). *See in Index* **Rizzio.**
**Rice, Alice Hegan** (born 1870). Amer. novelist, b. Shelbyville, Ky. ('Mrs. Wiggs of the Cabbage Patch', humorous tale of a ragged optimist, one of first and most popular of its kind).
**Rice, James** (1843–82). Eng. novelist. *See in Index* **Besant, Sir Walter.**
**Rice,** a cereal, **3013–5;** bobolink destroys, **446;** Burma, **541;** China, **744;** in Ganges valley, **1393;** introduced into Europe, **932;** Japan, **1864, 3013,** *pictures,* **3014;** mode of eating in Madagascar, **2105;** in Malay Peninsula, **2130;** production in Philippines, **2769,** *pictures,* **2766, 2767;** Siam, **3227;** starch content, **3344;** U.S. production, **3015, 582, 2068, 3291;** vitamins in, **3651.**
**Rice-bird,** **446.**
**Rice Institute,** at Houston, Tex.; non-sect., co-ed.; founded 1912 by William Marsh Rice, who endowed it with his entire fortune of $10,000,000; arts, science, engineering, architecture; **1688.**
**Rice paper,** **2673.**
**Richard I, the Lion-Hearted** (1157–99), king of England, **3015–6;** conspires against Henry II, **1896;** leads 3d Crusade, **930,** *picture,* **3017;** and Philip Augustus of France, **2762;** in Scott's 'Ivanhoe', **3153;** sells claim to Scotland, **3148.**
**Richard II** (1367–1400), king of England, **3016, 1634, 2050;** Wat Tyler's rebellion, **3571–2.**
**Richard III** (1452–85), king of England, **3016–7, 3068.**
**Richards, Theodore William** (born 1868), Amer. chemist, b. Germantown, Pa.; specialized in atomic weights and in physical and inorganic chemistry; **2512.**
**Richardson, John** (1797–1863), Canadian journalist and novelist; served in Canadian militia in War of 1812, and in regular Brit. army; **623.**
**Richardson, Henry Hobson** (1838–86), Amer. architect, whose Romanesque Trinity Church, Boston, has been voted by architects one of 10 most notable buildings in U.S. and has had great influence on Amer. architecture; considered greatest Amer. architect of his day; Springfield, Mass., buildings, **3332.**
**Richardson, Samuel** (1689–1761), Eng. novelist, **2539–40.**
**Richelieu** (*rēsh'ē-lụ*), **Cardinal** (1585–1642), Fr. churchman and statesman, **3017–8;** and Corneille, **892;** founds French Academy, **4;** Louis XIII supports, **2065;** in Thirty Years' War, **3488.**
**Richmond,** Calif. Industrial city on San Francisco Bay, 6 mi. n.e. of San Francisco; pop. 16,843; Standard Oil port and pipe line terminus; oil refinery, r.r. shops, brick, pipe, and steel works.
**Richmond,** Ind. Industrial city and farming center 68 mi. e. of Indianapolis, on Whitewater R.; pop. 26,765; makes lawn mowers, flour and grist mill products; settled 1816 by Friends from North Carolina.
**Richmond,** Ky. Town 25 mi. s.e. of Lexington; pop. 5622; decisive victory of Confederates under Gen. E. Kirby Smith 1862.
**Richmond,** Va., state cap. on James R.; pop. 171,667; **3018–9;** Davis monument, **968;** first electric street railway, **3371;** state capitol, *picture,* **3649.**
**Richmond,** residential suburb 9 mi. s.w. of London, England, **2056.**
**Richmond Borough,** New York City, **2498.**
**Richmond College.** At Richmond, Va.; corporate name of 2 coördinate institutions, Richmond College for men (founded as seminary 1832, chartered under present name 1840), and Westhampton College for women (opened 1914); liberal arts, law, etc.
**Richmond Park,** in Richmond, England, created by Charles I, **1157–8.**
**Richter** (*rĭĸ'tĕr*), **Johann Paul Friedrich,** (1763–1825), Ger. novelist and humorist; commonly called "Jean Paul"; **2541;** chief works, **1438.**
**Rick,** a unit of measure, **3715.**

**Rickets,** disease of early childhood, in which bones remain soft, producing deformities; cause, **2192;** and vitamins, **3651.**
**Rick'shaw.** Same as **Jinriksha.**
**Riddarholm Church,** Stockholm, **3358.**
**Riddles, 3019.**
**Rideau** (*rē-dō'*) **Canal,** Canada, **627, 2605, 1926.**
**Rideau Lake,** Ontario, at summit level of Rideau Canal; 21 mi. long; outlets in Ottawa R. through Ridcau R. and in L. Ontario through Cataraqui R.; Little Rideau L. (6 mi. long) is about 20 mi. distant; **627.**
**Rideau River,** Ontario, stream flowing n. to Ottawa R., **2604, 627.**
**Ridge,** in physiography, **2790.**
**Ridgefield,** Conn., residential town and summer resort 16 mi. s. of Danbury; battle (April 1777), **219.**
**Rid'ley, Nicholas** (1500?–55), Eng. Protestant reformer and martyr, bishop of Rochester; burned for heresy, **2157.**
**Rie'beck, Johann Van,** Dutch colonizer, **640.**
**Riel** (*rē-ĕl'*) **Louis** (1844–85), Canadian half-breed, leader of Riel and Saskatchewan rebellions, **3129, 2986, 2137.**
**Rienzi** (*rē-ĕn'zē*), **Cola di** (1313?–54), Rom. revolutionist; overthrew aristocracy and attempted to reestablish Rom. republic and world rule; hero of Bulwer-Lytton's 'Rienzi, The Last of the Roman Tribunes'; monument, **3056.**
**'Rienzi',** opera by Wagner, **3663.**
**Rifles,** firearms, **1254–6;** automatic, **2097;** how a modern army rifle works, *picture,* **1255;** Springfield, *picture,* **1253.**
**Rifling,** in firearms, **1254;** in cannon, **636;** principle of, **1556.**
**Riga** (*rē'gä*), cap. of Latvia, Baltic port at mouth of Dvina R.; pop. 570,000; **3019–20.**
**Riga, Gulf of,** inlet of Baltic Sea between Latvia and Esthonia, 100 by 60 mi.; receives Duna R.; named for city 7 mi. above; **1969,** *map,* **1196–7.**
**Riga, Treaty of.** Treaty between Russia and Poland signed March 18, 1921, by which Poland gained about 44,000 sq. mi. with a population of 3,685,000.
**Rigel** (*rī'gĕl*), a fixed star, **3342,** *charts,* **873, 3343.**
**Rigging,** of sailing ships, **3208, 3209;** pleasure boats, **444.**
**Riggs, Kate Douglas.** *See in Index* **Wiggin, Kate Douglas.**
**Right,** in European politics, **2869.**
**Right angle, 1423.**
**Rights, bill of.** *See in Index* **Bill of rights.**
**'Rights of Man',** book by Paine, **2626.**
**Rights of Man, Declaration of,** (1791), **393, 1368, 1956.**
**Right whale, 3724;** distinguished from sperm whale, **3726.**
**'Rigoletto'** (*rē-gō-lĕt'tō*), opera by Verdi, **3628.**
**'Rig-Veda'** (*rĭg-vā'dà*), Hindu epic, **1752, 1755, 486.**
**Riis** (*rēs*), **Jacob** (1849–1914). Amer. reformer and author, b. Denmark; improved New York tenement-house conditions ('Children of the Poor'; 'How the Other Half Lives').
**Riksdag** (*rĭks'dăg*), Swedish Parliament, **3404.**
**Ri'ley, James Whitcomb** (1853–1916), Amer. poet, noted for child and dialect poems, **3020, 1762,** *pictures,* **115, 3021;** quoted, **116, 440, 2934.**
**Rimini** (*rē'mē-nē*), **Francesca da.** *See in Index* **Francesca da Rimini.**
**Rimini,** Italy, historic town on Adriatic Sea 65 mi. s.e. of Bologna; pop. 50,000; bathing resort, fisheries; anc. Ariminum; arch of Augustus, *picture,* **1840.**
**Rimsky-Korsakof** (*rĭm'skĭ-kôr'sä-kŏf*), **Nicholas Andreievich** (1844–1908), Rus. composer; chief works, **2381.**
**Rin'derpest.** An infectious disease, believed to be caused by bacteria, affecting cattle, sheep, goats, and other quadrupeds.
**Rine'hart, Mary Roberts** (born 1876). Amer. novelist and playwright, b. Pittsburgh; especially successful in detective and mystery stories ('The Circular Staircase'; 'The Man in Lower Ten'; 'The Bat').
**'Ring and the Book',** poem by Browning, **518.**
**'Ring der Nibelungen',** a series of music dramas by Wagner based on the Nibelungen legends, **3663, 2504.**
**Ringed worms** or **annelids,** worms with round, segmented bodies, **3814, 3945;** include earthworms, **1066–8.**
**Rings,** in tree trunks, **3532.**
**Ring snake,** *picture,* **3258.**
**Rings of Saturn, 2817.**
**Ringstrasse,** street in Vienna, **3641.**
**Ring-tailed lemur, 1986.**
**Rink,** for curling, **940.**
**Rio** (*rē'ō*) **coffee, 824.**
**Rio de Janeiro** (*dā zhà-nā'rō*), cap. of Brazil and 2d largest city of S. Amer.; pop. 1,500,000; **3020, 3022,** *pictures,* **3284, 3288, 3289.**
**Rio de la Plata.** *See in Index* **Plata River.**
**Rio de Oro** (*dā ō'rō*), Spanish colony on w. coast of Africa s. of Morocco; 109,200 sq. mi.; pop. 30,000; arid sandy plateau; stock-raising near coast; *map,* **40–1.**
**Rio Grande** (*grän'dā*), r. of N. Amer. forming part of boundary between U.S. and Mexico; 2000 mi. from source in Colorado to Gulf of Mexico; **3022,** *map,* **2514–5;** boundary between U.S. and Mexico, **2207, 2208, 2209;** Elephant Butte Dam, **3022, 2465, 1829, 1139,** *picture,* **2464;** source, **842.**
**Rio Muni** (*mų'nē*) or **Spanish Guinea,** Span. colony in w. equatorial Africa on e. coast of Gulf of Guinea; 9470 sq. mi.; pop. 200,000; chief town Bata; cap., Santa Isabel on Fernando Po Isl.; *map,* **40–1.**
**Rio Negro** (*nā'grō*), one of chief tributaries of Amazon; rises in Colombia, flows e. 1000 mi. through n. Brazil; *map,* **494.**
**Rio Negro,** r. in cent. Argentina flowing e. 700 mi. from Andes in Chile to Atlantic, **190,** *map,* **191.**
**Rio Negro,** r. in cent. Uruguay flowing w. 300 mi. to Uruguay R., **3608.**
**Rio Teodoro,** r. of Brazil explored by Roosevelt; now officially named Roosevelt R.; **105, 3062,** *map,* **3288–9.**
**Ripley, George** (1802–80). Amer. essayist and critic, a leader in Brook Farm experiment.
**Ripon** (*rĭp'ŏn*). Town in n. England 22 mi. n.w. of York; fine 12th cent. cathedral.
**Ripon,** Wis., farming and mfg. center 75 mi. n.w. of Milwaukee; pop. 4000; Ripon College; beginning of Republican party, **3772.**
**Ripon College.** A non-sect. co-ed. institution at Ripon, Wis.; opened 1853 (chartered 1851) as Brockway College; under Presbyterian and Congregational control until 1868; liberal arts, science.
**Ripsimé, Saint,** early Christian martyr put to death, according to tradition, 301 A.D., **211–3.**
**'Rip van Winkle',** Washington Irving's story of a lovable good-for-naught, who, while hunting in the Catskills, drinks liquor offered him by Hendrik Hudson's legendary crew, falls asleep, and wakes 20 years after; dramatized version made famous by Joseph Jefferson; **1831;** Jefferson as, *pictures,* **1037.**
**Risorgimento** (*rē-zôr-ġē-mĕn'tō*), in Ital. history, **1842.**
**Ristori** (*rēs-tō'rē*), **Adelaide** (1822–1906). Ital. tragic actress, rival of Rachel ('Mary Stuart'; 'Medea'; 'Queen Elizabeth').
**Rit'ter, Karl** (1779–1859). Ger. geographer, founder of comparative geography.
**Ritty, Jacob,** inventor of cash register, **653.**
**Riukiu** (*rē-ų'kyų*) **Islands.** *See in Index* **Nansei.**
**River-hogs, 1671.**
**Rivers, 3022–3;** Africa, **34, 36;** Asia, **230;** Australia, **262, 264;** bores, **3497;** Canada, **604;** canyons, **639;** dams, **954;** dredging and dredges, **1039–41;** Europe, **1188, 1193;** geological action, **3022, 3023, 2790, 2791, 2358;** N. Amer., **2515;** rate of discharge into ocean, **2559, 256;** S. Amer., **3284;** subterranean, **3331;** transportation, **3524, 3526;** U.S., **3582;** valleys, **3615;** world's longest, **2267.** *See also in Index* **Alluvial soil; Delta;** and chief rivers by name.

WORLD'S LONGEST RIVERS

| *Name* | *Continent* | *Length in Miles* |
|---|---|---|
| Missouri-Mississippi | N. Amer. | 4200 |
| Amazon | S. Amer. | 4000 |
| Nile | Africa | 4000 |
| Congo | Africa | 3000 |
| Yangtze | Asia | 3000 |
| Yenisei | Asia | 3000 |
| Lena | Asia | 2860 |
| Amur | Asia | 2700 |
| Hwang | Asia | 2700 |
| Mekong | Asia | 2600 |
| Niger | Africa | 2600 |
| Mackenzie | N. Amer. | 2500 |
| Ob | Asia | 2500 |
| Volga | Europe | 2325 |

**Riverside,** Calif. Commercial city and tourist resort 50 mi. e. of Los Angeles; pop. 19,341; one of largest shipping points for lemons and oranges in world; packing houses, fruit canneries, portland cement works.
**Riverside Drive,** New York City, **2494;** Grant's tomb, *picture,* **2493.**
**Rives** (*rēvz*), **Amélie, Princess Pierre Troubetzkoy** (born 1863). Amer. novelist, b. Richmond, Va.; 'The Quick or the Dead', the story of the struggle in a woman's soul between love for her dead husband and for his living cousin; other novels are 'The Witness of the Sun', 'According to Saint John', 'As the Wind Blew'.
**Riviera** (*rē-vē-ā'rà*), picturesque dist. bordering Mediterranean coast between Nice, France, and Spezia, Italy; favorite winter resort; **2505;** French, *pictures,* **1349;** perfume farm, **2728;** Monte Carlo, **2312–3.**
**Riviere Du Loup** (*rē-vyĕr' dü lųp*) or **Fraserville,** Quebec, Mfg. town and summer resort on St. Lawrence R. 110 mi. below Quebec; pop. 8000; r.r. shops; lumber, iron products.
**Rivoli** (*rē'vō-lē*), **Duc de.** *See in Index* **Massena.**
**Rivoli.** Village in n. Italy 75 mi. w. of Venice, noted for Napoleon's victory over Austrians 1797.
**Rizzio** (*rēt'sē-ō*) or **Riccio, David** (1533?–66), Ital. secretary of Mary Queen of Scots, **2158;** place of assassination, **1080.**
**"R. L. S.," 3355.**
**Roach.** A carp-like fish with red fins; name sometimes given to shiner.
**Roaches** or **cockroaches, 817–8, 1788.**
**Road-runner.** A long-tailed ground-cuckoo of s.w. U.S. and n. Mexico; when pursued, seldom flies but runs with great swiftness with upraised wings.
**Roads and streets, 3023–7, 3526;** asphalt, **234–5, 3026;** paving brick, **505, 3027;** cobblestone, **3027;** con-

crete, **856, 3027, 674,** *pictures*, **3026, 3025;** macadam, **3026, 3024;** Roman, **3046; 3023;** social importance, **3526;** wood block, **3027.**

**Roanne** (*rō-än'*), France. Mfg. and r.r. center 40 mi. n.w. of Lyons; pop. 37,000; head of navigation on Loire R.

**Roanoke** (*rō'a-nōk*), Va., industrial city in s.w. on Roanoke R.; pop. 50,842; farming and iron-mining center; Roanoke College near by; **3650.**

**Roanoke College.** At Salem, Va.; Lutheran institution for men; founded 1853; courses leading to B.A. degree, commercial course, etc.

**Roanoke Island,** isl. 10 by 2 mi., off coast of N. Carolina; unsuccessful colony founded by Raleigh 1585–87; **2521.**

**Roanoke River,** formed by confluence of the Dan and Staunton rivers at Clarksville in s. Virginia; flows s.e. 250 mi. through North Carolina into Atlantic; sometimes name is applied to include Staunton R.; **3648,** *maps*, **3650, 2518;** early route to the West, **3582.**

**Roaring forties,** region between 40th and 50th parallels in N. Atlantic Ocean; also zone of same latitude in S. Hemisphere; both regions characterized by strong westerly winds; **3750.**

**Robben Island,** off s.e. coast Sakhalin Isl.; seals, **3167.**

**Robber** or **coconut crab, 914,** *picture*, **913.**

**Robbia** (*rŏb'bĭ-ä*), **Andrea della** (1435?–1525?), nephew and greatest pupil of Luca, **1850, 3158.**

**Robbia, Luca della** (1400?–82), Ital. sculptor, earliest and greatest of the great Della Robbia family, first sculptor to work in glazed baked clay and to use colored enamel reliefs in architecture; singing gallery in Florence, **3158,** *picture*, **3160.**

**Robbins Reef,** New York harbor, **2003.**

**Robert I** (865?–923). King of France, son of Robert the Strong and younger brother of Odo; permitted Charles III to succeed his brother, but revolted 921 and was crowned king 922; his grandson was Hugh Capet.

**Robert I, the Bruce,** king of Scotland. *See in Index* **Bruce.**

**Robert II** (1316–90), king of Scotland, grandson of Robert Bruce; founds Stuart line, **3372.**

**Robert I, the Devil** (d. 1035), **Duke of Normandy.** Father of William the Conqueror; his great strength and ferocity subject of medieval legends; aided Edward the Confessor in exile.

**Robert II, Duke of Normandy** (1056?–1134), son of William I, succeeded to Normandy, **3739;** claims Eng. throne, **3740, 1633;** leads First Crusade, **929, 3740.**

**Robert Guiscard** (*gēs-kär'*) ("the resourceful") (1015–85), Norman soldier of fortune; began conquest of Sicily from the Saracens (completed by his brother Roger I and consolidated by his nephew Roger II), becoming duke of Apulia and Calabria; aids pope against Henry IV, **1541.**

**Robert of Molesme, Saint** (d. 1108), founder of Cisterians, **2299.**

**Robert the Strong** (d. 866). Count of Anjou and Blois; at first rebelled against Charles the Bald, but later earned his surname and won king's confidence by defense of the Seine and Loire valleys; his two sons, Odo and Robert I, became kings of France.

**Robert College,** Constantinople, **3561.**

**Robert-Fleury** (*rō-bĕr'-flē-rē'*), **Joseph Nicolas** (1797–1890). Fr. historical painter of vigorous talents ('Scene of St. Bartholomew'; 'Triumphal Entry of Clovis at Tours'; 'Children of Louis XVI in the Temple').

**Robert-Fleury, Tony** (1837–1911). Fr. painter, taught many of the best known painters of 19th cent.; like his father, Joseph, excelled in historical paintings.

**Roberts, Bartholomew** (d. 1722), **2810.**

**Roberts, Charles George Douglas** (born 1860), Canadian poet and prose writer; canon of Christ Church Cathedral, New Brunswick; **623, 624.**

**Roberts, Emma,** Eng. religious worker, **3833.**

**Roberts of Kandahar, Frederick Sleigh Roberts, Earl** (1832–1914), Brit. soldier, **3027;** in Boer War, **447;** relief of Kandahar, **31.**

**Robertson, Frederick William** (1816–53). Eng. preacher, famous as "Robertson of Brighton"; emphasized fundamental spiritual truths.

**Robertson, James** (1742–1814), Amer. pioneer, b. Brunswick County, Va., formed settlement in what is now Tenn.; kept Indians at peace; **3469.**

**Robertson, William** (1721–93). Scotch historian; with Gibbon and Hume formed great trio of his generation; his 'History of Scotland' and 'History of Reign of Charles V', though now superseded, set new standard in historical writing and research.

**Robertson, Sir William Robert** (born 1859). Brit. field-marshal who rose from the ranks; in 1915 was Gen. French's chief of staff; Dec. 1915 to Feb. 1918 chief of imperial general staff.

**Roberval** (*rō-bêr-vàl'*), **Jean François de la Roque, Seigneur de** (1500?–47?), Fr. Canadian colonizer, **652.**

**Robespierre** (*rō'bĕs-pyĕr*), **Maximilien** (1758–94), Fr. Rev. leader, **3027–8, 1370;** and Danton, **961, 3028;** leads Jacobins, **1859;** and Mme. Roland, **3039.**

**Rob'in, 3028,** *picture*, **420;** belongs to thrush family, **3494, 412;** food required, *picture*, **400;** hatching period, **403;** nest, **406,** *picture*, **407;** seasonal migrations, **2231.**

**Robin Goodfellow** or **Puck, 2230.**

**Robin Hood,** famous English outlaw, **3028–33;** stories: 'How Little John Got His Name', **3029–30;** 'Shooting-Match at Nottingham'; **3030–3.**

**'Robin Hood',** opera, **2584.**

**Robinson, Edwin Arlington** (born 1869). Amer. lyric poet, b. Head Tide, Maine ('The Man Against the Sky'; 'Merlin'; 'Avon's Harvest'; 'The Three Taverns'); his work is intellectual in quality, sincere in tone and feeling, distinctively American in point of view; much of his poetry will live after the flashy work of more popular contemporaries has been forgotten.

**Robinson, Henry Crabb** (1775–1867), Eng. journalist and diarist; friend of Lamb, Wordsworth, Coleridge, and Southey ('Diary'; 'Reminiscences'; 'Correspondence').

**Robinson, James Harvey** (b. 1863), Amer. historian and educator, b. Bloomington, Ill.; a pioneer in teaching the "new history" which draws on anthropology, sociology, and natural science, as well as on war and politics ('The New History'; 'The Mind in the Making'); quoted, **1654.**

**Robinson, John** (1575?–1625), Eng. nonconformist, pastor of Leyden congregation of Pilgrim Fathers; organized *Speedwell-Mayflower* colony, but died at Leyden; **2176.**

**Robinson, Sir John Beverley** (1791–1863). Canadian jurist and statesman, chief justice of Upper Canada from 1829 to his death; opposed reforms of Baldwin and Lafontaine and was trusted guide of the "Family Compact."

**Robinson, Theodore** (1852–96), Amer. painter, b. Irasburg, Vt. ('In the Sunlight'; 'On the Tow-Path'); brilliant and original in technique; **2634.**

**'Robinson Crusoe',** novel by Defoe, **2539;** basis in fact, **933–4.**

**Rob Roy** (Robert MacGregor or Campbell) (1671–1734), celebrated Scotch outlaw, **3033.**

**Rob Roy canoe, 446.**

**Robsart** (*rŏb'särt*), **Amy** (1532–60). Wife of Lord Robert Dudley, afterwards Earl of Leicester, who was suspected of having caused her sudden death in order that he might be free to marry Queen Elizabeth; story told in Scott's 'Kenilworth'.

**Rob'son, Eleanor** (Mrs. August Belmont) (born 1879). Amer. actress, b. England; first appeared on Amer. stage 1897; starred in 'Merely Mary Ann', 'Salomy Jane', 'The Dawn of a Tomorrow' (her greatest success); retired 1910.

**Robson, Stuart** (1836–1903). Amer. comedian, b. Annapolis, Md.; his real name was Robson Stuart; greatest success in 'The Henrietta' by Bronson Howard.

**Robson, Mt.,** British Columbia, one of highest peaks of Canadian Rocky Mts., **3036;** glacier, *picture*, **602.**

**Roc** (*rŏk*). A monster bird in Arabic legend, said to have its home in Madagascar; so large that it could carry off elephants, and Sinbad the Sailor tells of an egg which was "50 paces in circumference."

**Roca** (*rō'ka*), **Julio Argentino** (1843–1914). Argentine soldier and statesman, rose to general in war with Paraguay (1865–70); suppressed rebellion 1880, and elected president (1880–90; again 1898–1904); greatly strengthened national administration and patriotic spirit.

**Rochambeau** (*rō-shän-bō'*), **Jean Baptiste Donatien de Vimeur, Count de** (1725–1807), Fr. soldier, **3033.**

**Rochdale** (*rŏch'dāl*), England. Mfg. town 10 mi. n.e. of Manchester; pop. 94,000; cotton and woolen goods; 'Rochdale Pioneers', first Eng. coöperative society founded 1844.

**Rochefort** (*rōsh-fōr'*), **(Victor) Henri, Marquis de Rochefort-Luçay** (1830–1913). Fr. journalist and politician, bitter opponent of Napoleon III, supporter of the Commune, several times exiled and imprisoned for his fearless attacks on persons and projects he believed wrong.

**Rochefort,** France. Fortified naval harbor 75 mi. n. of Bordeaux near mouth of Charente R.; pop. 35,000; near by Napoleon surrendered to British 1815.

**Rochefoucauld** (*rōsh-fu̧-kō'*), **François de la.** *See in Index* **La Rochefoucauld.**

**Rochelle** (*rō-shĕl'*), **La,** France. *See in Index* **La Rochelle.**

**Rochelle salt,** an ingredient of Seidlitz powders, **3438, 3116.**

**Roch'ester,** England. Port on Medway R. 26 mi. s.e. of London, adjoining Chatham and Strood; pop. 32,000; noted cathedral, ruined castle.

**Rochester,** Minn., industrial city in s.e., 35 mi. n. of Iowa boundary; pop. 13,722; flour and grist mills; cameras; Mayo Clinic, **1687, 2256.**

**Rochester,** N.Y., mfg. city in w. part; pop. 295,750; **3033;** button industry, **550;** train ferry, **2967.**

**Rochester, University of.** At Rochester, N.Y.; co-ed.; founded 1850

under Baptists but now non-sect.; arts and sciences, engineering; college for men and coördinate college for women.
**Rock,** classification of, **1417.** For detailed references *see* Study Outline, **3864.**
**Rock crystal, 2945.**
**Rock-dove,** ancestor of all pigeons and doves, **2804.**
**Rock'efeller, John Davison** (born 1839), Amer. capitalist, founder of Standard Oil Company, **3034, 793.**
**Rockefeller, John Davison, Jr.** (born 1874). Amer. capitalist, b. Cleveland, Ohio; first won public notice as leader of Sunday school class in New York; since his father's retirement in 1911 increasingly prominent in family's business and philanthropic activities.
**Rockefeller, William** (1841–1922), Amer. capitalist, **3034.**
**Rockefeller Foundation, 3034, 1086.**
**Rockefeller Institute for Medical Research, 3034, 1086.**
**"Rocket,"** Stephenson's locomotive, **2962, 2044, 3353.**
**Rockets,** fireworks, **1264–6.**
**Rockford,** Ill., mfg. city 75 mi. w. of Chicago on Rock R.; pop. 65,651; Rockford College; agricultural implements, hosiery, furniture; **1736.**
**Rockford College.** Institution for women at Rockford, Ill.; founded 1849; arts and sciences, home economics, secretarial work, teaching.
**Rockhampton,** Australia. Port in Queensland, on Fitzroy R. near e. coast; pop. 21,000; trade in gold, meat.
**Rock Hill College.** At Ellicott City, Maryland; men; Catholic; founded 1857; liberal arts.
**Rockingham, Charles Watson-Wentworth,** 2d **Marquis of** (1730–82), Eng. statesman; as prime minister 1765–6 tried to conciliate Amer. colonies by repealing Stamp Act; again prime minister for 3 months in 1782; and Burke, **540.**
**Rock Island,** Ill. Mfg. city on Mississippi R. opposite Davenport, Iowa; pop. 35,177; large govt. arsenal and armory on isl. between these cities; plows and tractors, lumber, paint; Augustana College.
**Rock melon,** a cantelope, **2195–6.**
**Rock oil** or **petroleum, 2749–55.**
**Rock River,** a tributary of the Mississippi in s. Wisconsin and Illinois; 350 mi. long; *map,* **1731.**
**Rock-salt, 3115;** in Carpathian Mts., **647.**
**Rock weed,** *picture,* **3170.**
**Rocky Ford,** Colo., town 54 mi. e. of Pueblo; pop. 3746; in irrigated farming region; **2195;** melons, **2195.**
**Rocky Mount,** N.C. Commercial town 120 mi. n. of Wilmington; pop. 12,742; cotton and tobacco trade; large r.r. repair shops; machinery, fertilizers, lumber.
**Rocky Mountain goat, 146, 392,** *picture,* **147.**
**Rocky Mountain locust, 1506.**
**Rocky Mountain Park,** in Colo., 50 mi. n.w. of Denver; 359 sq. mi.; many high peaks; **2400.**
**Rocky Mountains,** chain of ranges extending along e. side of N. Amer. Cordilleras from Mexico to Alaska, **3035–6, 3580,** *maps,* **2514–5;** in Alaska, **76, 77;** Ariz., **200;** in Canada, **602, 603, 512,** *pictures,* **600, 602, 511, 82;** in Colorado, **839, 842,** *pictures,* **838, 839, 343, 845;** early explorers, **2102, 1989;** Glacier National Park, **1466;** Grand Canyon, **1495–7;** in Idaho, **1725;** marine fossils, **1334;** Mexico, **2209, 2210;** Mont., **2308–9;** New Mexico, **2462, 2466;** Utah, **3609;** Wyo., **3818;** Yellowstone National Park, **3829–30.**
**Rocky Mountain sif'fleur** (*sĕ-flûr'*), **1647.**
**Rocky Mountains Park,** Canada, **83,** *pictures,* **600, 601, 603, 82.**
**Rococo** (*rō-kō'kō*) **style,** in architecture, **188.**
**Rocroi** (*rō-krwä'*), France. Town near Belgian frontier, 50 mi. n. of Reims; great Fr. victory over Spaniards 1643 in Thirty Years' War.
**Rod,** a unit of measure, **3715;** origin, **3714.**
**Ro'dents,** the order of gnawing animals, **3036, 2132,** *Study Outline,* **3951;** evolutionary position, **128;** kept down by hawks and owls, **402;** structure of gnawing teeth, **356.**
**Rodin** (*rō-dăn'*), **(François) Auguste** (1840–1917), Fr. sculptor, **3036–8;** bust of J.P. Laurens, *picture,* **3162;** influence, **3164, 3158.**
**Rodman, Hugh** (born 1859). Admiral, U.S. Navy, b. Frankfort, Ky.; graduated U.S. Naval Academy 1880; on U.S.S. *Raleigh* 1898; commanded U.S. battleships with British Grand Fleet in World War; admiral and commander-in-chief Pacific Fleet 1919.
**Rodmar,** miser in 'Nibelungenlied', **2504.**
**Rodrigues** (*rô-drē'gĕs*). Island in Indian Ocean; dependency of Brit. colony Mauritius; 40 sq. mi.
**Roe, Edward Payson** (1838–88). Amer. novelist and Presb. minister, whose novels were among the best sellers of their day ('Barriers Burned Away'; 'From Jest to Earnest'; 'A Face Illumined').
**Roe,** fish eggs used as food, **1090;** of sturgeon, **3374.**
**Roebuck** or **roe-deer.** A small deer (*Caprcolus caprea*) of Europe and w. Asia; about 2½ ft. tall; male has small erect antlers usually with 3 tines.
**Roeb'ling, John Augustus** (1806–69). Amer. engineer, b. in Prussia; built the suspension bridge over Niagara R. (1852), and designed Brooklyn Bridge, which was built by his son Washington A.
**Roemer** (*rû'mĕr*) or **Römer, Ole** (1644–1710), Danish astronomer; measures speed of light, **1997.**
**Roentgen** (*rûnt'gĕn*), **Wilhelm Konrad** (born 1845), Ger. physicist, 1901 Nobel prize winner; discovers X-rays, **3825;** *picture,* **1119.**
**Roent'genogram,** an X-ray picture, **3826.**
**Roentgen rays.** Same as **X-rays.**
**Roeskilde** (*rûs'kĭl-dē*) or **Roskilde,** Denmark. Old town 16 mi. w. of Copenhagen on Zealand Isl.; cap. until 1443; cathedral with tombs of early Danish kings.
**Roger de Coverley papers, 1178, 1165.**
**Rogers, Henry H.** (1840–1909), Amer. capitalist, b. Fairhaven, Mass.; vice-pres. and executive head of Standard Oil Co., and controlling factor in other great enterprises, **3084.**
**Rogers, John** (1829–1904). Amer. sculptor ('Picket Guard'; 'One More Shot'—immensely popular sentimental bric-a-brac).
**Rogers, John R.** (born 1856), Amer. inventor, born Roseville, Ill., **2021.**
**Rogers, John** (1500?–55), Eng. martyr, burned at stake for preaching against Catholicism, **389.**
**Rogers, Samuel** (1763–1855). Eng. banker, poet, art patron; published at his own expense several volumes of poems which, if not brilliant, showed care and taste ('Italy'; 'Poems'; 'Pleasures of Memory'); declined laureateship after death of Wordsworth.
**Rogers, Capt. Woodes,** Eng. navigator, **933.**
**Rogers, Mt.,** highest point (5719 ft.) in Blue Ridge Mts., **3648.**
**Rogers Pass Tunnel,** British Columbia, **3551, 3552.**
**Rog'geveen, Admiral Jacob,** Dutch explorer, **1070, 2623.**
**Rogue elephant, 1126.**
**Rohan** (*rō-äṅ'*), **Henri, Duke of** (1579–1638). Fr. Huguenot general, leader of Protestant party after death of Henry IV; secured confirmation (1623) of Edict of Nantes.
**Rohan, Louis René, Prince de** (1734–1803). Fr. cardinal, ambassador to Austria (1772–74) and grand almoner of France; imprisoned 1785–86 for his connection with the Diamond Necklace Affair.
**Rohlfs, Anna K. Green.** *See in Index* **Green.**
**Rohlfs, Friedrich Gerhard** (1831–96). Ger. explorer; traveled in Morocco in guise of Mohammedan; explored Sahara, visiting many regions unknown to Europeans ('Travels in Morocco'; 'Across Africa').
**Ro'land,** hero of Charlemagne's army, celebrated in medieval song and verse, **3038.**
**Roland** (*rō-läṅ'*), **Jean Marie** (1734–93), Fr. politician, **3039.**
**Roland, Madame** (1754–93), social leader in Fr. Rev. days, **3039, 1370.**
**Rolf.** *See in Index* **Rollo.**
**Rolf Boldrewood.** *See in Index* **Boldrewood.**
**Rolfe** (*rōlf*), **John** (1585?–1623), Eng. colonist in Virginia; married Pocahontas.
**Rolf the Ganger.** *See in Index* **Rollo.**
**Rolland** (*rō-läṅ'*), **Romain** (born 1860), Fr. novelist and uncompromising idealist and antimilitarist; called (in vain) on Ger. authors to join him in opposing World War ('Jean Christophe'; 'Liluli'; 'Colas Breugnon'; 'Pierre and Luce'); Nobel prize winner 1915; **2541.**
**Rolled gold, 1482.**
**Roller,** a bird, found chiefly in tropical countries, which tumbles like a tumbler pigeon; only one species in Europe; altitude range, *picture,* **397.**
**Rolling mill, 1824, 1826,** *pictures,* **1823.**
**Rolling stock, 2965–6.**
**Rollo** (*rŏl'ō*), **Rolf,** or **Rou** (10th cent. A.D.), Norse conqueror of what became Fr. duchy of Normandy (911–912), **2526, 2513.**
**Roll sulphur, 3390.**
**Romagna** (*rō-mä'nyä*), former province of Papal States, now divided into Ital. provinces of Bologna, Ferrara, Ravenna, and Forli, **1841;** joins united Italy, **1837, 3638.**
**Roma'ic,** modern Gk. dialect, **1538.**
**Romain, Jules.** Same as **Giulio Romano.**
**Roman art, 1532–3;** enamels, **1145;** influence of Etruscans, **1185–6;** portrait sculpture, **1533,** *picture,* **1532, 3043, 3156.** —*Architecture,* **177–9;** arch and dome, **177,** *picture,* **181;** mosaics, **2330;** Pompeian remains, **2876–7;** remains at Rome, **3050–2,** *pictures,* **3051, 3053, 3055, 3057;** ruins of arena at Nîmes, *picture,* **1342.**
**Roman candles, 1264, 1266.**
**Roman Catholic church, 763–4;** adherents, **2994, 3250;** Bible, **389, 390;** in Canada, **622, 1971;** College of Cardinals, **643;** disestablished in Chile, **738;** Easter and Holy Week, **1070;** in France, **1370, 2394, 2814, 787;** in Germany, **1441, 347;** in Gt. Brit., Emancipation Bill, **2559, 2706;** 'Index' of prohibited books, **2918;** in Ireland, **1807, 1808, 1810, 2559;** Knights of Columbus, **1935;** martyrs, **2156;** monks and monasticism, **2298–2302;** music, **2377, 2378;** Nicene creed, **870;** papacy, **2664–6, 2745;** papal honors, **979.** *See also in Index* **Papacy; Reformation.**
**Romance, 3039–40, 2539;** Arthurian legends, **3068–70, 223–4;** burlesqued by Cervantes, **683;** 'Song of Roland', **3038;** in Spain, **3307.** *See also in Index* **Novel.**
**Romance languages, 3040, 2771.**

**Roman Congregations.** *See in Index* **Congregations, Roman.**
**'Roman de la Rose', 702.**
**Romanes** (*rō-mā'nĕs*), **George John** (1848–94), Brit. naturalist ('The Philosophy of Natural History before and after Darwin'); and evolution theory, **964.**
**Romanesque** (*rō-măn-ĕsk'*) **architecture, 180–1;** Pisa cathedral, *pictures*, **184, 2811.**
**Roman history** (to 476 A.D.), **3040–8;** chief events summarized, **1655–7;** peoples of Italy, **1842;** legendary period, **3040–2, 29, 3058, 3229, 3494–5;** influence of Etruscan culture, **1185–6;** Gk. colonies, **1520.**
*The Republic* (509–27 B.C.), **3041–6;** Cincinnatus dictator, **766–7;** development of govt., **3042–4;** conquest of Italy, **3044–5;** war with Pyrrhus, **2941, 3044;** Punic Wars, **3045–6, 650–1, 1575–6;** siege of Syracuse, **175;** conquest of Spain, **3303;** conquest of Greece, **1525–6;** Marius and Sulla, **3046;** Spartacan rebellion, **3310;** conquests in Asia, **2878, 1891;** conquest of Gaul, **1352, 1445–6, 564;** Caesar and fall of the republic, **3046, 564–5, 2878;** Catiline's conspiracy, **765;** establishment of the principate, **258, 789.**
*The Empire*, **3046–8;** rule of Augustus, **257–8;** defeat in Germany, **1446;** Britain conquered, **1152;** rule of Nero, **2436;** destruction of Pompeii, **2875–6;** empire reaches greatest extent, **3047, 1446, 3642,** *map*, **3042;** Marcus Aurelius, **2146–7;** decline of empire, **3048, 3047;** malaria mosquito contributes to downfall, **2334;** Aurelian conquers Palmyra, **2648;** Constantine and the separation of East and West, **870, 1194;** Gothic invasions, **1491, 26, 73;** invasions of Huns, **1704, 763;** Vandals, **3617–8.** For later Roman history *see in Index* **Byzantine Empire; Italy.**

EMPERORS OF ROME (TO 395 A.D.)

| | |
|---|---|
| 27 B.C.—14 A.D. | Augustus |
| 14-37 A.D. | Tiberius |
| 37-41 | Caligula |
| 41-54 | Claudius |
| 54-68 | Nero |
| 68-69 | Galba |
| 69 | Otho |
| 69 | Vitellius |
| 69-79 | Vespasian |
| 79-81 | Titus |
| 81-96 | Domitian |
| 96-98 | Nerva |
| 98-117 | Trajan |
| 117-138 | Hadrian |
| 138-161 | Antonius Pius |
| 161-180 | Marcus Aurelius |
| 180-192 | Commodus |
| 193 | Pertinax |
| 193 | Didius Julianus |
| 193-211 | Septimius Severus |
| 211-217 | Caracalla |
| 217 | Macrinus |
| 218-222 | Heliogabalus |
| 222-235 | Alexander Severus |
| 235-238 | Maximinus |
| 238 | Gordian I, Gordian II } jointly |
| 238 | Pupienus, Balbinus } jointly |
| 238-244 | Gordian III |
| 244-249 | Philip the Arabian |
| 249-251 | Decius |
| 251-253 | Gallus |
| 253 | Aemilian |
| 253-260 | Valerian } jointly |
| 253-268 | Gallienus } jointly |
| 268-270 | Claudius II |
| 270-275 | Aurelian |
| 275 | Tacitus |
| 276-282 | Probus |
| 282-283 | Carus |
| 284 | Carinus, Numerianus } jointly |
| 284-305 | Diocletian } jointly |
| 286-305 | Maximianus } jointly |
| 306-337 | Constantine the Great |
| 337-361 | Constantius |
| 361-363 | Julian |
| 363-364 | Jovianus |

DIVISION OF THE EMPIRE

| | | |
|---|---|---|
| *West* | | |
| 364-375 | Valentinian | |
| 375-383 | Gratian | } jointly |
| 375-392 | Valentinian II | } jointly |
| 392-395 | Theodosius I | |
| *East* | | |
| 364-378 | Valens | |
| 379-395 | Theodosius I | |

**Rom'ani,** language of gipsies, **1463.**
**Romania** (*rō-mā-nē'a*), **Cape,** headland at s.e. extremity of Malay Peninsula, **226.**
**Roman law, 1972;** bankruptcy law, **327;** in France, **2065;** jus gentium, **1794;** Justinian codifies, **1905;** torturers, **2918.**
**Roman numerals, 2542.**
**Romanof** (*rō-mä'nŏf*), family name of czars of Russia from 1613 to downfall of the empire, **3089, 2745.**
**Romanof, Michael** (1596–1645), czar of Russia; elected 1613; **3089.**
**Romans, Epistle to.** Book of the New Testament; letter written by Paul to the Christians at Rome; deals with justification by faith and relations of Jews and Christians.
**Romansch** (*rō-mănsch'*), dialect in Switzerland, **3415.**
**Roman'ticism,** in literature, the tendency to emphasize the imaginative, emotional, and natural, as opposed to the restraint and formality of classicism and the matter-of-fact attitude of realism; applied especially to movement in later 18th and early 19th cents.; in Eng. literature, **1166, 1036, 3788;** in Fr. literature, **1365, 1694;** in Ger. literature, **1438;** in Ital. literature, **1833;** in the novel, **2540.**
**Roman Wall.** *See in Index* **Hadrian's Wall.**
**Rome (ancient):** agriculture, **48;** aqueducts, **163–4, 3702;** armor, *pictures*, **215, 1151;** bakeries, **496;** baths, **3052, 3058, 2876,** *picture*, **3057;** calendar, **573, 574;** catacombs, **3052;** cement, **674;** census, **678;** citizenship, **3045, 3046;** coins, **2282,** *picture*, **2283;** Colosseum, **3050, 3052, 3058,** *pictures*, **181, 3051;** costumes, **897,** *pictures*, **898, 3221;** dentistry, **997;** engineering, **1149, 506, 3552;** family names, **2388;** festivals, **1012, 1673, 1566, 2248, 3129;** food, **708, 2579, 3385;** Forum, **3050, 3052,** *pictures*, **3053;** geographical knowledge, **1416; 2931–2;** gladiators, **1466, 1033;** glass-making, **1474;** houses, **2876–7, 3368, 1383;** lamps, **1958,** *picture*, **1959;** language and literature (*see in Index* **Latin language; Latin literature**); libraries, **455;** life of people, **2876–7, 3066, 1026;** lighthouses, **2004;** Pantheon, **3058, 1201,** *picture*, **181;** poor relief, **2878, 3047;** postal system, **2896, 870;** religion and mythology, **3041, 3634–5** (for detailed refcrences *see* Study Outline, **3981**); roads, **3526;** sewerage system, **3183, 3041;** ships, **3207;** slavery, **3248–9, 3047, 3310;** theaters, **3484, 1033;** Tiber R., **3494;** tools and instruments, *picture*, **3045;** trade, **881, 1282, 2648, 3235;** water-clock, **797;** weights and measures, **3713;** writing and writing materials, **2709, 2666–7, 455.** For history *see in Index* **Roman history.**
**Rome (modern),** cap. of Italy and seat of the pope; pop. 591,000; **3049–58;** history, **2178, 1399, 1838;** St. Peter's, **3052, 3054,** *picture*, **187;** Vatican, **3054–5, 1201,** *picture*, **187;** Vatican library, **1992, 3055,** *picture*, **2665.**
**Rome,** Ga. Trade center on Coosa R., 60 mi. n.w. of Atlanta; pop. 13,252; cotton, lumber, furniture, foundry products.
**Rome,** N.Y. City 15 mi. n.w. of Utica on Mohawk R. and Erie Canal; pop. 26,341; brass and copper goods; large creameries; here Stars and Stripes were first unfurled in battle; scene of battle of Oriskany 1777.
**'Ro'meo and Juliet',** tragedy by Shakespeare, **3058, 3190;** quotations from, **3192;** Sothern and Marlowe in, *picture*, **1037.**
**Römer, Ole.** Same as **Roemer.**
**Rom'ney, George** (1734–1802), Eng. portrait painter, **2631;** 'Serena', *picture*, **2981.**
**'Romola'** (*rŏm'ō-là*). George Eliot's novel based on Savonarola's life; Romola, the heroine, is the beautiful and noble-minded daughter of an aged Florentine scholar.
**Rom'ulus and Remus, 3058, 3041.**
**Romulus Augustulus,** last Rom. emperor, **3048.**
**Roncesvalles** (*rŏn-sĕ-văl'ĕs*), village in n. Spain, near pass in w. Pyrenees where Charlemagne's rear guard was defeated and Roland slain, **3038.**
**Ronsard** (*rôn-sär'*), **Pierre de** (1524–85), Fr. "prince of poets"; leader of the Pléiade, a group of writers who sought to remold Fr. language and poetry on classical lines; **1364.**
**Roof,** of buildings, **177, 178–80, 186, 531.**
**"Roof of the world," 226.**
**Rook,** bird of the crow family, **2124.**
**Rookery,** originally a breeding-place or colony of rooks; of penguins, *picture*, **2864;** of seals, *picture*, **3167.**
**Rookwood pottery, 766, 2903.**
**Roon, Albrecht, Count von** (1803–79), a Prussian field-marshal and war minister 1859–73; military authority of his time; **427.**
**Roosevelt** (*rō'zĕ-vĕlt*), **Franklin Delano** (born 1882). Amer. politician, b. Hyde Park, N.Y.; distant cousin of President Roosevelt; anti-Tammany leader in N.Y. state; assistant sec. of navy 1913–20; Democratic candidate for vice-president 1920.
**Roosevelt, Quentin** (1897–1918), **3063.**
**Roosevelt, Theodore** (1858–1919), 26th president of U.S., **3059–63;** character, **3063;** explorations, **3062;** quoted, **116, 3601, 3571;** relations with Taft, **3428–9;** chief writings, **3063.** —*Administrations*, **3060–2, 3606;** anthracite coal strike, **172–3;** Alaska boundary, **79;** Venezuelan policy, **3623, 2307;** recognizes Panama, **2649, 3062;** Standard Oil Co. dissolved, **3034;** intervenes in Russo-Japanese War, **3098;** Santo Domingo protectorate, **3125;** makes Pershing brigadier-general, **2733;** supports Sims' navy reforms, **3243;** conservation, **3060, 870.**
**Roosevelt, Theodore, Jr.** (born 1887). Eldest son of President Roosevelt, b. Oyster Bay, N.Y.; lieut.-col. A.E.F., fought at Cantigny, in St. Mihiel and Meuse-Argonne offensives; N.Y. legislature 1919; assistant sec. of navy 1921.
**Roosevelt,** N.J. Borough on Rahway R. and Staten Island Sound, 16 mi. from New York City; pop. 11,047; has steel and metal mfrs., fertilizers and chemicals.
**Roosevelt Dam, 1829,** *pictures*, **200, 1830.**
**Roosevelt River.** *See in Index* **Rio Teodoro.**
**Root, Elihu** (born 1845), Amer. lawyer and statesman, b. Clinton, N.Y.; sec. of war 1899–1905; sec. of state 1905–09; U.S. senator from N.Y. 1909–15; member of various arbitration tribunals and commissions; headed mission to Russia 1917; Washington limitation of armament conference 1921–22; Nobel prize, **2512.**
**Root, George Frederick** (1820–95). Amer. popular song composer, b. Sheffield, Mass. ('Battle Cry of Freedom'; 'Tramp, Tramp, Tramp'; 'There's Music in the Air').

**Root,** of plants, **3063, 2827;** adaptation to environment, **1306;** air plants, **2593, 69;** alfalfa, **89;** barley, *picture,* **672;** chemotropism, **2828;** clover taps the subsoil, **809;** cypress "knees," **946;** forerunners seen in algae, **92;** mangrove, **2135;** mesquite, **2201;** pressure, **3273;** sarsaparilla, **3127;** sensitiveness, **2829;** structure, *picture,* **2824;** in water-plants, **3700.**
**Root,** of tooth, **3452.**
**Root crops,** those grown for their edible roots; beets, **365;** carrots, **650;** first introduced in agriculture, **48, 1778;** parsnips, **2691;** turnips, **554.** *See also in Index* **Bulbs, tubers, and rootstocks.**
**Rope and twine, 3063–5;** coir fiber, **818;** hemp, **1630;** jute, **1906;** knots, hitches, and splices, **1937–41;** nettle, **2443;** Plymouth, Mass., **2842;** sisal fiber, **3244.**
**Roper, Margaret,** 2325, *picture,* **2326.**
**Rops** (*rōps*), **Félicien** (1833–98). Belgian illustrator and etcher, whose work, though sometimes too decadent and cynical to be pleasing, is almost unique in power of execution.
**Roque** (*rōk*), a form of croquet, **926.**
**Roquefort** (*rōk'fôrt*) **cheese, 709.**
**Rorqual** (*rôr'kwäl*), a whale, **3724, 3726,** *picture,* **3725.**
**Rosa** (*rō'zä*), **Salvator** (1615–73). Ital. painter, chief master of Neapolitan school, wild and romantic in life and art.
**Rosa, Monte** (15,217 ft.), Alpine peak, **3413.**
**Rosa,** the rose genus of plants, **3066.**
**Rosaceae** (*rō-zā'sĕ-ē*), rose family of plants, **3066, 3941;** almond, **99;** classified, **3533;** pear, **2701;** sloe or blackthorn, **3251;** spirea, bridal wreath, and hardhack, **3327.**
**Rosales** (*rō-zā'lēz*), the rose order, including roses, pitted fruits, apples, and the bean family, **3941.**
**Ros'alind,** in Shakespeare's 'As You Like It', **224, 225.**
**Rosamond, Fair.** In Eng. legend, beloved of King Henry II, hidden away by him in a bower at heart of a labyrinth in Woodstock; found by jealous Queen Eleanor and forced to drink poison.
**Rosario** (*rō-sä'rē-ō*). The 2d city of Argentina, r.r. center and port on Parana R., 214 mi. above Buenos Aires; pop. 225,000; large foreign trade.
**Rosas** (*rō'säs*), **Juan Manuel** (1793–1877). Argentine dictator 1835–52; bloody despot; overthrown by combination of foreign and domestic enemies.
**Roscom'mon.** County in cent. Ireland, Connaught province, bounded on e. by Shannon R.; 985 sq. mi.; pop. 94,000; cap. Roscommon; sheep- and cattle-raising.
**Rose,** genus of flowering plants, **3066,** *pictures,* **3067, 160, 2827;** emblem of sun god, Helios, **3010.**
**Roseate tern,** *pictures,* **1550, 1551.**
**Rose'bery, Archibald Philip Primrose, Earl of** (born 1847). Eng. Liberal statesman, orator, and writer; premier 1894–95, and long thereafter a power in politics, though he held no office; wrote biographical studies of Pitt, Peel, Cromwell, Napoleon, and Lord Randolph Churchill.
**Rose-breasted grosbeak,** *picture,* **418.**
**Rose-chafer,** a plant-eating beetle, **369.**
**Rosecrans** (*rō'zē-kränz*), **William Starke** (1819–98), Amer. Civil War general, commander of Army of Cumberland from 1862 till after defeat 1863 at Chickamauga, **700, 1361, 3490.**
**Rose diamond,** diamond cut with small facets, **1004.**
**Rose family.** *See in Index* **Rosaceae.**
**Rosegger** (*rō'zĕg-ĕr*), **Peter** (1843–1918). Austrian poet and novelist; 'The Eternal Light' ('Das Ewige Licht'), one of the most popular German novels of 19th cent.
**Rose locust,** a tree, **2045.**
**Ro'senwald, Julius** (born 1862). Amer. merchant and philanthropist; b. Springfield, Ill.; vice-pres. Sears, Roebuck & Co. 1895–1910, pres. thereafter; a generous contributor to wide variety of philanthropic, educational, and civic institutions; during World War member advisory commission Council of National Defense.
**Rose of Japan,** the camellia, **591, 1628.**
**Rose-of-Jericho,** a cabbage-type plant, **554.**
**Rose of Sharon.** An ornamental shrub (*Hibiscus syriacus*); Biblical rose of Sharon was probably a kind of narcissus.
**Rose Polytechnic Institute.** At Terre Haute, Ind.; men; opened 1883 (organization begun 1874); mechanical engineering, civil engineering and architecture, electrical engineering, chemistry.
**Rose quartz, 2945.**
**Roses, attar of.** *See in Index* **Attar.**
**Roses, Wars of the,** contest between rival houses of York and Lancaster for Eng. throne, **3066, 3068;** Edward IV, **1088;** Henry VII and Bosworth Field, **3547, 1635;** Queen Margaret, **1634–5;** Richard III slain, **3017.** *See also in Index* **Lancaster, House of; York, House of.**
**Rosetta** (*rō-zĕt'ä*), Egypt, town on Rosetta mouth of Nile R.; pop. 17,000; formerly of commercial importance; Rosetta Stone found near by; Nile R., **2510, 1096.**
**Rosetta Stone,** key to hieroglyphic inscriptions of anc. Egypt, **1098–9,** *picture,* **1099.**
**Rosewood,** hard, close-grained, fragrant wood of Brazilina tree of the bean family; prized in cabinet-making; in perfumes, **2728.**
**Ros'in, 2997;** in linoleum, **2018.**
**Rosinante** (*rŏz-i-năn'tē*), Don Quixote's famous raw-boned steed, **683.**
**Rosin-weed,** a "compass plant," **855.**
**Ros'kilde,** Denmark. *See in Index* **Roeskilde.**
**Ros'lyn,** New York, village 18 mi. n.e. of Brooklyn; pop. 1500; home and burial place of W.C. Bryant; **2061.**
**Rospigliosi,** noble Rom. family; Pope Clement IX was its most famous member, **3057.**
**Ross, Betsy** (1752–1836), traditional maker of first Amer. flag, **1288;** home, Philadelphia, *picture,* **2761.**
**Ross, Sir James Clark** (1800–62), Brit. admiral and polar explorer; nephew of another Brit. admiral and polar explorer, Sir John Ross; Antarctic explorations, **2863, 145;** finds North Magnetic Pole, **2860.**
**Ross, Robert** (1766–1814), Brit. maj.-gen.; captures Washington, D.C., **3672.**
**Ross, Sir Ronald** (born 1857), Brit. physician, discoverer of life-history of malaria parasite in mosquitoes, **2334–5.**
**Rossbach** (*rōs'bäĸ*), Germany, village 25 mi. w. of Leipzig; battle (1757), **3180.**
**Ros'sel Island,** in s. Pacific Ocean s.w. of New Guinea; natives, **2451.**
**Rosset'ti, Christina Georgina** (1830–94). Sister of Dante Gabriel Rossetti; a lyric poet of distinction; excelled in religious and mystical verse ('Goblin Market'; 'A Pageant'; 'Sing Song').
**Rossetti, Dante Gabriel** (1828–82), Eng. poet and painter; leading spirit of Pre-Raphaelite Brotherhood, **2632, 2329, 1167.**
**Ross Ice Cap** or **Great Ice Barrier,** in Antarctic region, **145, 2863.**
**Rossini** (*rōs-sē'nē*), **Gioacchino Antonio** (1792–1868), Ital. operatic composer; chief works, **2381.**
**Ross Sea,** in Antarctic region, *picture-map,* **144;** discovered by Capt. J. C., Ross, **2863;** Amundsen's base, **2864.**
**Rostand** (*rō-stäN'*), **Edmond** (1869–1918), Fr. dramatist; chief works, **1036.**
**Rostock** (*rŏs'tŏk*), Germany. Largest city of Mecklenburg and one of chief Baltic ports; 95 mi. n.e. of Hamburg; pop. 68,000; univ.; an old Hanse town.
**Rostof** (*rŏs-tŏf'*). Important commercial center of s. Russia on Don R. 20 mi. from Sea of Azof; pop. 205,000; grain trade, flour mills, iron works, annual fair.
**Roswell** (*rŏz'wĕl*), N.M., town in s.e. on Hondo R.; pop. 7033; **2467;** irrigation project, **2465.**
**Ro'tary printing press, 2916,** *picture,* **2917.**
**Rotary transformer, 3524.**
**Rota'tion of crops.** *See in Index* **Crop rotation.**
**Rote** (*rōt*), a musical instrument, *picture,* **1590.**
**Ro'thenburg-on-the-Tau'ber,** one of the oldest towns in Bavaria, Germany, **1443.**
**Rotherham** (*rŏth'ĕr-ăm*), England. Mfg. town 6 mi. n.e. of Sheffield on Don R.; pop. 72,000; iron and steel products, glass, pottery.
**Rothschild** (*rŏths'chīld*), great Jewish banking family of Ger. origin with unprecedented international influence; total fortunes estimated in 1915 as $2,000,000,000; origin, **1356.**
**Rothschild, Mayer Anselm** (1743–1812), Ger. merchant and moneylender, in whose charge the elector of Hesse-Cassel, fleeing from Fr. Rev. armies, left his treasures and thus laid foundation of Rothschild fortune; house at Frankfort, **1356.**
**Rothschild, Nathan Mayer, Baron** (1777–1836). Third son of first Rothschild; head of the firm's London branch and founder of its unique international greatness; staked all on Napoleon's overthrow and financed Brit. govt. in crisis of 1813.
**Ro'tifers,** the "wheel animalcules," **3814, 3945;** evolutionary position, *diagram,* **128.**
**Rotogravure',** printing process, **1172.**
**Rot'te,** small r. of Holland, **3068.**
**Rotten boroughs,** in Eng. politics, **2687.**
**Rot'terdam,** chief seaport and 2d largest city of Holland; pop. 507,000; **3068,** *picture,* **2440.**
**Roubaix** (*rų-bā'*), France. Mfg. town in n. near Belgian border; pop. 123,000; woolen and linen goods, carpets; taken by Germans 1914; by Allies Oct. 1918.
**Rouen** (*rų-äN'*), France, important mfg. and trading city on Seine R. 75 mi. n.w. of Paris; pop. 125,000; anc. cap. of Normandy; **2513, 1344, 1348, 1350;** Joan of Arc Tower, *picture,* **1894;** Seine dredged, **3174.**
**Rouget de Lisle** (*rų-zhä' dē lēl*), **Claude Joseph** (1760–1836), Fr. song-writer; composes 'Marseillaise', **2404.**
**Roughage,** in diet, **1321, 663.**
**Rough-legged hawk, 1606.**
**Rough Riders,** regiment in Spanish-American War, **3060, 3306.**
**Roumania.** Same as **Rumania.**
**Round clam, 783.**
**"Roundheads,"** nickname for Puritans, **693.**
**Roundhouse, 2967.**
**Round Table,** in the Arthurian legends, **3068–70.** *See also in Index* **Arthurian legends.**
**Roundworms, 3813–4, 3945;** evolutionary position, *diagram,* **128.**
**Rousseau** (*rų-sō'*), **Jean-Jacques** (1712–78), Fr. philosopher, **3070–1, 1365,** *picture,* **1364;** influence on Ger. literature, **1436;** island at Geneva named for, **1411.**

**Rousseau, Théodore** (1812–67), Fr. painter, a leader of Barbizon school, **2632.**
**Rove-beetle** or **Devil's coach-horse, 371,** *pictures,* **369.**
**Roving,** cotton yarn, **904.**
**Row'an tree,** European mountain ash, **2357.**
**Rowe, Nicholas** (1673–1718), Eng. poet, **2848.**
**Rowe'na,** heroine of Scott's 'Ivanhoe', **3152–3.**
**Rowing, 444, 2610,** *pictures,* **445, 833.**
**Rowland, Henry Augustus** (1848–1901), Amer. physicist, b. Honesdale, Pa.; diffraction grating, **3314.**
**Roxburghshire** (*rŏks'bŭr-ō-shēr*). Border county of s.e. Scotland; 666 sq. mi.; pop. 44,000; cap. Jedburgh.
**Roxbury.** Formerly a city in Mass., since 1867 part of Boston.
**Royal,** size of paper, **2673.**
**Royal Academy,** British, **4.**
**Royal Frederick University, 2536.**
**Royal Gorge.** A canyon in cent. Colorado 8 mi. long and 2600 ft. deep cut by the Arkansas R. in solid granite.
**Royal Institution of Great Britain,** scientific institution founded 1799 and chartered 1800 to further research and spread knowledge; conducts public evening lectures and provides research facilities; famous workers and lecturers, **969, 1224, 3572.**
**Royalists.** In Eng. history, the partisans of Charles I and II; also called Cavaliers.
**'Royal Italian March', 2405.**
**Royal Marine Artillery, 2149.**
**Royal Marine Light Infantry, 2149.**
**Royal Military College of Canada.** At Kingston, Ont.; men; founded 1876; military science, civil engineering, surveying; leading to commissions in Imperial Army and Canadian Permanent Forces and clerkships in Dominion Civil Service.
**Royal Northwest Mounted Police** of Canada, **2866, 2528,** *picture,* **2865.**
**Royal palm,** a tall species with feathered leaves; uses in Cuba, **936.**
**Royal Society,** oldest scientific society in Gt. Brit.; foreign membership limited to 50; holds weekly sessions during winter months, with reports and discussions, publishes reports of scientific research, and awards several medals annually; founded, **1165;** Newton president, **2478.**
**Royal tern, 1550.**
**Royce, Josiah** (1855–1916), Amer. philosopher and educator, b. Grass Valley, Calif.; author of many books, including 'The Spirit of Modern Philosophy', clearly and charmingly written; and William James, **3327.**
**Roycroft Shop.** Colony of artists and artisans at East Aurora, N.Y., founded by Elbert Hubbard.
**Rozier** (*rō-zē-ā'*), **Jean Pilâtre de,** first to ascend in balloon, **310, 312,** *picture,* **311.**
**'Rubaiyat'** (*rų-bī-yät'*), collection of poems by Omar Khayyam (*rubaiyat,* plural of *rubai,* means "quatrains," four-line poems), **2738.**
**Rubber, 3071–6;** in Africa, **859, 1068–9, 2507;** in Amazon basin, **3284;** atrocities in Putumayo region, **836, 2742;** in Bolivia, **450;** in Borneo, **468;** in Brazil, **493, 495, 3286;** collecting rubber sap, **3073–4;** differs from gutta-percha, **1554;** East Africa, **1069;** Ecuador, **1079;** Goodyear discovers vulcanizing, **3072;** Honduras export, **1676;** India-rubber tree, a species of fig, **1237;** making rubber goods, **3074–6;** McIntosh invents waterproofed garments, **3072;** New Guinea, **2453;** in Peru, **2742;** substitute made from corn, **890.**
**Ru'bens, Peter Paul** (1577–1640), Flemish painter, **3076–7, 2630;** 'Dedication of Decius Mus', *picture,* **2640;** paintings at Antwerp, **153;** at Brussels, **520;** Van Dyck pupil of, **3618.**
**Rubiaceae** (*rų-bī-ā'sĕ-ē*). the madder family of plants, **3943.**
**Rubicon** (*rų'bĭ-kŏn*), anc. name of river emptying into Adriatic 25 mi. s. of Ravenna, formerly n.e. boundary of Italy; Caesar crosses, **564.**
**Rubid'ium,** a silvery metallic element, **4042.**
**Rubinstein** (*rų'bĭn-stīn*), **Anton Gregor** (1829–94), Russian (Jewish) composer and pianist; chief works, **2381.**
**Ruble** (*rų'bl*). Rus. monetary unit (gold) worth 51½ cents before World War; coined in silver; enormous issues of paper currency by Bolsheviki reduced value of paper rubles to almost nothing; rate of exchange, "fixed" by Soviet govt. commission in 1922 at 7,000,000 to the dollar.
**Ru'bus,** a genus of the rose family; includes blackberry, **432;** loganberry, **2046,** raspberry, **2977.**
**Ruby,** a precious stone, **1409;** artificial, **1410,** *picture,* **1411;** Burma, **541;** Siam, **3227.**
**Ruby-crowned kinglet, 1926,** *picture,* **420.**
**Ruby-throat,** a humming-bird, **1698,** *picture,* **416.**
**Ruby wasp,** *picture,* **1785.**
**Rück'ert, Friedrich** (1788–1866), Ger. poet and oriental scholar ('Sonnets in Armor'; 'Eastern Roses'—translations and imitations of Eastern poetry).
**Rudder,** device for steering ship, **3208,** *picture,* **3213.**
**Rude** (*rüd*), **François** (1784–1855), Fr. sculptor, **3158;** 'Neapolitan Fisherboy', *picture,* **3162.**
**Ru'dolf, Lake,** in Brit. E. Africa, n.e. of Victoria Nyanza, **1068,** *map,* **1069.**
**Rudolph** (Fr. *Raoul*) (d. 936). Duke of Burgundy and king of the Franks; succeeded his father-in-law, Robert I, in 923; most of his reign devoted to wars with the Normans and with Charles III.
**Rudolph of Hapsburg** (1218–91), Ger. king and Holy Roman emperor 1273–91; founder of Imperial House of Austria; **273, 1447.**
**Rue.** An herb with bitter leaves, formerly used in medicine; also used in magic rites.
**Ruff, 900.**
**Ruffed grouse, 1544–5.**
**Rug'by,** England, town 80 mi. n.w. of London on Avon R.; pop. 22,000; famous school, **3139.**
**Rugby football, 1324.**
**Rügen.** Rugged picturesque isl. in Baltic n. of Pomerania, Prussia, to which it belongs; 377 sq. mi.; pop. 50,000; cap. Bergen.
**Rugs and carpets, 3077–80;** Navajo, **204–7;** Pennsylvania output, **2720.** *See also in Index* **Spinning and weaving.**
**Ruhr** (*rųr*) **River,** chief Prussian tributary of the Rhine (150 mi.); coal fields, **1443, 1178.**
**Ruhr** or **Roer River,** small stream in Rhenish Prussia and Netherlands, **2207.**
**Ruisdael.** *See in Index* **Ruysdael.**
**Rum,** island, **1625.**
**Rum,** a liquor, **84, 1859.**
**Ruma'nia,** a kingdom of s.e. Europe; 122,000 sq. mi.; pop. 17,400,000; **3080–2,** *maps,* **308, 1196–7;** cap. Bucharest, **523;** Danube R., **962;** language, origin, **3040;** people, **3080,** *pictures,* **273, 3080, 3081, 3082;** surface, **3081, 307.** —*History,* **3080–1, 523;** Balkan Wars, **310;** World War, **3080, 3795, 3812.**
**Rumans'** or **Ruma'nians, 3080, 3082.**
**Rumelia** (*rų-mē'lī-à*). Name formerly applied to Turkish possessions in Balkans; especially cent. Albania and w. Macedonia; autonomous province of E. Rumelia established 1878; united with Bulgaria 1885.
**Rum'ford, Benjamin Thompson, Count** (1753–1814), physicist, soldier, and political adventurer, b. Woburn, Mass.; in Brit. state department during Rev. War; minister and adviser to elector of Bavaria 1784–98; **1617–8.**
**Ru'minants,** the cud-chewing animals, **3082–3, 663.**
**Rumpelmayer, E.,** balloon flight, **312.**
**Rump Parliament,** in Eng. history, **2689, 924, 925.**
**Runkelstein, Castle,** in Tyrol, *picture,* **270.**
**Runnymede** (*rŭn'ĭ-mēd*), plain in Surrey, England, on s. bank of Thames, 20 mi. s.w. of London; Magna Carta sealed, **2121, 1896.**
**Runt pigeons, 2804,** *picture,* **2805.**
**Rupee** (*rų-pē'*), coin of India, **1752.**
**Ru'pert of Bavaria, Prince** (1619–82), nephew of Charles I of England; at Marston Moor, **924;** obtains charter for Hudson's Bay Co., **1692.**
**Rupert River,** Quebec, 350 mi. n.w. to James Bay, *map,* **616.**
**Rupert's Land,** former name of large territory around Hudson Bay, Canada, named for Prince Rupert, **1692, 3129.**
**Rural credits, 1224.**
**Rural free delivery, 2894.**
**Rural population,** U.S., **3592.**
**Ru'rik the Oarsman** (died 879), Norse leader, founds Russian kingdom, **2528,** *picture,* **2527.**
**Rush, Benjamin** (1745–1813.) Amer. physician, b. Philadelphia, signer of Declaration of Independence, treasurer of U.S. mint, and founder of Philadelphia Dispensary (first in Amer.).
**Rushes,** leafless aquatic plants, **3083.**
**Rushlight, 3083.**
**Rus'kin, John** (1819–1900), Eng. writer, art critic, and social reformer, **3083, 1178;** quoted, **1242, 3098, 2981.**
**Russell, George.** *See in Index* **"Æ."**
**Russell, John,** first **Earl** (1792–1878), Brit. statesman, **3083–4.**
**Russell, Lord William** (1639–83). Eng. patriot; tried to exclude Catholic successor to Charles II; executed after mock trial as accomplice in Rye House plot.
**Russia,** a vast country of n.e. Europe and Asia; area (before 1914) 8,417,118 sq. mi.; pop. 178,378,800; **3084–96,** *map,* **1196–7;** agriculture, **3086, 3575, 3732;** calendar, **574;** chief cities and mfrs., **3088, 2747–9, 1922, 2330, 2332–3, 2560;** climate, **3086, 2973;** coöperative societies, **879;** Cossacks, **895–6;** elevation, *map,* **1190–1;** fisheries, **3086, 3374, 654;** in Ice Age, **1720;** L. Ladoga, **1955;** land tenure, **3087, 3088;** language, **3096;** Lapland, **1962;** minerals, **3086, 3607, 2755, 2135, 1479, 663–4;** mountains, **3606–7, 663–4;** national debt, **2399;** national song, **2405;** people, **3250, 3660, 895–6, 3440;** population, **3085,** *map,* **1190–1;** rainfall, *map,* **1190–1;** religions, **3088, 2994;** rivers and canals, **3085–6, 626, 654, 3660;** seal fisheries, **3167;** surface features, **3085–6;** Siberia, **3227–9** (*see also in Index* **Siberia**); transportation, **3085–6, 3088;** Turkestan, **3555–6;** Ukraine, **3575;** vegetation, **3086,** *map,* **1190–1** water boundaries, **3085, 321, 434, 653–4;** woman suffrage, **3779.**
*History,* **3088–96;** chief events summarized (1801– ), **1661;** origin and early history, **3088–9, 1922, 2528,** *picture,* **2527;** Mongol invasion, **2285, 3096–7;** modern state founded by Ivan III and Ivan IV, **1853, 3089;** progress under Peter the Great and Catherine II, **3090,**

3097, 2745–7; Petrograd founded, 2247; war with Charles XII of Sweden, 698, 2747; Baltic provinces conquered, 1180, 1969; Seven Years' War and partition of Poland, 3180, 2147, 2856; Alexander I and the Napoleonic Wars, 85, 3090, 2394, 2396, 1196, 3404; under Nicholas I, 2505–6, 3090, 1526, 922, 3560; Alexander II, 85, 3090–1; war with Turkey (1877–78), 3560, 310, 1013; nihilist movement, 3097, 85, 3091; Alexander III, 85, 3091–2; Nicholas II, 2506, 3092; Hague Peace Conferences, 1559, 1196; war with Japan (1904–05), 3098, 1870, 1944. —*World War and after*, 3094–6, 3789–98, 3812; Nicholas II overthrown, 2506; Kerensky establishes government, 3095; Bolshevist revolution, 450–1, 1986, 3544–5; disruption of empire, 3084, 1180, 1248, 1969, 2030; effect in Petrograd, 2749; counter-revolution in Siberia, 3229; war with Poland, 2857; war in the Ukraine, 3575.

RULERS OF RUSSIA

HOUSE OF RURIK

| | |
|---|---|
| 1462-1505 | Ivan III, the Great |
| 1505-33 | Vassili Ivanovitch |
| 1533-84 | Ivan IV, the Terrible |
| 1584-98 | Feodor Ivanovitch |
| 1598-1605 | Boris Godunov |
| 1605-13 | Time of the troubles |

HOUSE OF ROMANOV

| | |
|---|---|
| 1613-45 | Michael |
| 1645-76 | Alexis |
| 1676-82 | Feodor Alexiévitch |
| 1682-89 | Ivan V, Peter the Great } jointly |
| 1689-1725 | Peter the Great (alone) |
| 1725-27 | Catherine I |
| 1727-30 | Peter II |
| 1730-40 | Anna Ivanovna |
| 1740-41 | Ivan VI |
| 1741-61 | Elizabeth |
| 1762 | Peter III |
| 1762-96 | Catherine II |
| 1796-1801 | Paul |
| 1801-25 | Alexander I |
| 1825-55 | Nicholas I |
| 1855-81 | Alexander II |
| 1881-94 | Alexander III |
| 1894-1917 | Nicholas II |
| 1917- | Revolutionary government. |

**Russia leather,** 1977.

**Russian church.** *See in Index* **Greek Orthodox church.**

**Russian language,** 3096, 2772; alphabet, 101; personal names, 2389.

**Russian literature,** 3096–8; drama, 1036, 1038; folk-songs, 1318; novel, 2541; Tolstoy, 3512; Turgenief's influence, 3554.

**Russian mile,** 3715.

**Russian Quakers** or **Doukhobors,** 3128.

**Russian thistle,** 3490.

**Russian** or **Western Turkestan,** 3555–6, 228.

**Russian wolfhound,** 1021, *picture,* 1023.

**Russo-Japanese War** (1904–05), 3098, 1870; immediate cause, 1944; effect on Russia, 3092; Roosevelt's mediation, 3062.

**Russo-Turkish Wars:** (1828–29), 1661, 1526, 309–10, 2505; (1877–78), 3560, 310, 1013, 468, 3080, 3177.

**Rust,** oxidized iron, 3098–9, 1816, 2643, 105.

**Rustchuk** (*rŭst-chŭk'*) or **Ruschuk,** Bulgaria. Town on Danube; pop. 37,000; formerly important Turkish frontier fortress nearly destroyed by Russians 1877; tobacco mfrs.

**Rusts,** various fungi parasitic upon plants, 3099–3101, 1382; harbored by barberries, 1628.

**Rutaba'ga,** yellow Swedish turnip, 554; when and how to plant, 1397.

**Rut'gers College.** At New Brunswick, N.J.; chartered 1766;. men; non-sectarian; classical school and Rutgers Scientific School, which is the State College of Agriculture and Mechanic Arts; liberal arts, agriculture, civil engineering, sciences.

**Ruth,** heroine of Book of Ruth in Old Testament, 3101–2.

**Ruthe'nia,** an autonomous province of Czecho-Slovakia; 4670 sq. mi.; pop. 606,000; 948.

**Ruthenians,** a branch of the Slavs, 3575, 948, 273, 271.

**Ruthe'nium,** a spongy metallic element, 4042.

**Rutherford, Sir Ernest** (born 1871). Brit. physicist; while professor of physics, McGill Univ. (1898–1907), with F. Soddy conducted notable researches into radioactivity and atomic structure ('Radioactivity'; 'Radioactive Substances and Their Radiations').

**Rutland.** Smallest of the Eng. counties, between Leicestershire, Northamptonshire, and Lincolnshire; 52 sq. mi.; pop. 17,500; cap. Oakham.

**Rutland,** Vt., 2d city of state, near center, on Otter Creek; pop. 14,954; greatest marble industry in U.S.; 3632, 3633.

**Rutledge, Edward** (1749–1800). Amer. statesman, brother of John, b. Charleston, S.C.; signer of Declaration of Independence.

**Rutledge, John** (1739–1800). Amer. patriot and jurist, b. Charleston, S.C.; member Stamp Act Congress, justice of U.S. Supreme Court, and a framer of U.S. Constitution.

**Ruwenzori** (*rų-wĕn-zō'rē*), mt. group in Uganda Protectorate, e. cent. Africa, just n. of equator; highest point 16,800 ft.; 36.

**Ruysdael** or **Ruisdael** (*rois'dăl*), **Jacob** (1628?–82), one of greatest of Dutch landscape painters, 2631.

**Ruyter** (*roi'tẽr*), **Michael Adriaanszoon de** (1607–76), Dutch admiral; redoubtable adversary of France and England, 2066, 435.

**Ryan, John D.** (born 1864). Amer. capitalist, director of aircraft production during World War.

**Ry'dal Mount,** home of Wordsworth, *picture,* 3788.

**Rye,** a cereal grain, 3102; bread, 498; flour, 1302; in Germany, 1440; in N. Dakota, 2524; in Norway, 2534; in Russia, 3086; starch content, 3344; in Sweden, 3404.

**Rye House Plot.** Conspiracy (1683) of extreme opponents of Eng. Catholic succession to assassinate Charles II and his brother, the Duke of York, afterward James II; used as pretext for execution of innocent political opponents, including Algernon Sidney and Lord William Russell.

**Ryks museum,** Amsterdam, 119.

**Ryswick** (*rĭs'wĭk*), Holland, village near The Hague; Peace of Ryswick (1697), 3741.

# S

THERE was a time when the letter S looked more like our W. Turn the W on end and cut off the bottom line and you will get something that looks very much like our S. The story of S begins, in Egyptian picture writing, with the hieroglyph  known as the "inundated garden," representing papyrus or lotus plants growing out of the water. When it came to be written in the Egyptian running hand like this  it no longer looked like a garden, and the Phoenicians called it *Shin*, which means "teeth." If you look closely, you can see the outline of the lower teeth, and the chin and beard, as well. But as the Phoenicians themselves made it  it was like a very squatty W. Then the Greeks took it and standing it on end made it into their letter **Σ** (*Sigma*). Later the last stroke was omitted, and then when the Romans had rounded the points it was our letter S.

**Saale** (*zäl'ē*) **River,** in cent. Germany, flows n. 250 mi. to Elbe R., **1107,** *map,* **1440.**

**Saalfeld** (*zäl'fĕlt*). Old Ger. town on Saale R., 60 mi. s.w. of Leipzig; ruined Sorbenburg, castle said to have been built by Charlemagne; French defeated Prussians 1806.

**Saar** (*zär*) **Basin,** valley of Saar R. in w. Germany along Lorraine boundary; 751 sq. mi.; pop. 660,000; since World War administered by League of Nations; plebiscite to be held in 1934 to determine ultimate status; **1348.**

**Saarbrück** (*zär'brük*). Ger. city on Saar R., 40 mi. n.e. of Metz; pop. 105,000; in Saar Basin; scene of first action in Franco-Prussian War; coal-mining center.

**Sabbath, 3103.**

**Sabbath, Witches', 3773.**

**Sa'ber, 3422, 3423,** *pictures,* **3422.**

**Sabine** (*să-bēn'*) **Cross-Roads.** Place 3 mi. s.e. of Mansfield, La., where Confederates defeated Federal forces and stopped Red R. expedition, April 8, 1864.

**Sabine Lake,** expansion of Sabine R. in Texas 5 mi. above Gulf of Mexico; forms part of boundary between Texas and Louisiana; 20 mi. long, 9 mi. wide; *map,* **2070;** navigation, **3474.**

**Sabine River,** a stream flowing 500 mi. to Gulf of Mexico, forming greater part of boundary between Texas and Louisiana, **3476, 3473,** *maps,* **3474, 2070.**

**Sabines** (*să'bīnz*), an anc. people of cent. Italy, **3040.**

**Sable,** in heraldry, **1639.**

**Sable, Cape,** Fla., **3580,** *map,* **3584–5.**

**Sable fur, 2155, 1390;** imitated, **1389.**

**Sable Island.** A small sandy isl. of Nova Scotia 45 mi. long; scene of many shipwrecks.

**Sabotage** (*să-bō-täzh'*), **1947.**

**Sacajawea** (*să-kä-jä-wā'ä*), "Bird Woman," **1989.**

**Saccharin** (*săk'ä-rĭn*), an artificial sweetening substance, **3389;** obtained from toluol, **814.**

**Sacculi'na,** a crustacean parasitic upon crabs, **2678.**

**Sachs** (*säks*), **Hans** (1494–1576), Ger. shoemaker-poet, greatest of the mastersingers, ardent adherent of Luther; chief works, **1438;** hero of 'Die Meistersinger', **3663;** home in Nuremberg, **2543.**

**Sachsenhausen** (*zäK'sĕn-hou-zĕn*), a part of the city of Frankfort, Germany, **1357.**

**Sackett's Harbor,** N.Y. Village on L. Ontario, 11 mi. w. of Watertown; former naval station; unsuccessfully attacked by British in War of 1812.

**Sackville, Thomas.** *See in Index* **Dorset.**

**Saco** (*sa'kō*) **River,** rapid stream in New Hampshire and s. Maine; 175 mi. to the Atlantic; abundant water-power; *map,* **2126.**

**Sacramen'to,** Calif., state cap. and a leading mfg. city; on Sacramento R., about 90 mi. n.e. of San Francisco; pop. 65,908; **3103;** state capitol, *picture,* **581.**

**Sacramento Mts.,** range 50 mi. long, in Otero County, s.-cent. New Mexico, **3036.**

**Sacramento River,** Calif., rises on Mt. Shasta in n., flows 400 mi. s. through fertile valley between Sierra Nevadas and Coast Range to Suisun Bay, 50 mi. above San Francisco, **3103, 3580,** *picture-map,* **577;** outlet, **576;** rice growing, **582.**

**Sac'raments, 764;** Luther's attitude, **2987.**

**Sacré Coeur** (*säk-rā kûr'*), church in Paris, **2684.**

**Sacred bo-tree, 685, 3533, 525.**

**Sacred College** or **College of Cardinals, 643.**

**Sacred Host, 764.**

**Sacred ibis,** of Egypt, **3364,** *picture,* **3363.**

**Sacred lotus,** an Egyptian waterlily, **2063.**

**Sacred Wars.** In Gk. history, series of wars waged (600–338 B.C.) in defence of Apollo's shrine at Delphi by members of Amphictyonic League.

**Sacs,** Indians. *See in Index* **Sauks.**

**Sad'ducees,** anc. Jewish sect composed largely of the priestly aristocracy; opposed to Pharisees; rejected traditions of the elders, holding only to observances of the written law; skeptical in doctrine; **1891.**

**Sadi** (*sä'dē*) or **Saadi** (1184?–1292?). Assumed name of Muslih Ad-din, greatest Persian didactic poet ('Gulistan' or 'The Rose Garden').

**Sadi-Carnot.** *See in Index* **Carnot, M. F. Sadi.**

**Sadowa** (*sä'dō-vä*), Czecho-Slovakia, village 4 mi. n.w. of Königgratz; decisive engagement of Seven Weeks' War (1866), **1448.**

**Saeters** (*sä'tĕrs*), mountain pastures of Norway, **2532.**

**Saetersdal,** region in Norway, **2532.**

**Safed',** Palestine. City 8 mi. n.w. of Sea of Galilee; pop. 14,000; important fortified place during Crusades; repeated earthquakes in 19th cent.; modern rabbinical school.

**Safety lamp,** invented by Davy, **969,** *picture,* **968.**

**Safety matches, 2170.**

**Safety valve, 3350.**

**Saffron,** a yellow coloring matter and drug obtained from crocus, **923.**

**Sa'gas,** old Scandinavian prose tales, **3134, 2526.**

**Sage, Russell** (1816–1906). Amer. capitalist, associate of Jay Gould in railway speculation; his widow used his fortune to establish the Russell Sage Foundation and other philanthropies.

**Sage,** a plant of the mint family, **2258;** used as spice, **3318, 3319.**

**Sagebrush,** a shrub of the aster family, **3103–4.**

**Sagebrush State, 2445.**

**Sage hen,** a large grayish grouse, **1545.**

**"Sage of Concord," 1141.**

**"Sage of Monticello," 1883.**

**Sag'halin.** Same as **Sakhalin.**

**Sag'inaw,** Mich., mfg. and jobbing city on Saginaw R. 95 mi. w. of Detroit; pop. 61,903; center of Michigan coal fields; glass, beet sugar, salt, lumber, iron and steel products; **2224.**

**Saginaw Bay,** arm of Lake Huron, **1704,** *map,* **2226.**

**Sagittarius** (*săg-ĭ-tā'rĭ-ŭs*), a sign of the zodiac, **3840.**

**Sa'go,** starchy foodstuff made from palms, **3104;** in New Guinea, **2453.**

**Sagres** (*sä'grĕs*), small seaport of Portugal, home of Henry the Navigator, **2889, 1638.**

**Sagua'ro** or **giant cactus,** in Arizona, **562,** New Mexico, **2464.**

**Saguenay** (*săg-ĕ-nā'*) **River,** Quebec, outlet of L. St. John flowing s.e. into St. Lawrence R. 120 mi. below Quebec, **1970.**

**Sagun'tum,** modern **Sagunto** or **Murviedro,** Spain. Anc. Iberian city near Mediterranean, 20 mi. n. of Valencia; Rom. ally; heroic resistance to siege of Hannibal 219 B.C. immediate cause of 2d Punic War.

**Saha'ra,** great desert region (3,500,000 sq. mi.) in n. Africa, **3104–6, 33,** *maps,* **40–1, 1095;** caravans, **3105–6, 588–91;** date palms, **966–7;** dunes, **3121;** elevation, *map,* **40–1;** population, **3105, 3106,** *map,* **40–1;** rainfall, **3104, 2973,** *map,* **40–1;** reclamation, **1828;** trade, **3106, 3115, 3541, 3542;** vegetation, *map,* **40–1.**

**Saidi** (*sī'dē*) or **Saida,** Syria, town on w. Mediterranean coast, 25 mi. s. of Beirut; pop. 15,000; on site of ancient Sidon, **2774.**

**Saigon** (*si-gŏn'*). Port and trade center of s.e. French Indo-China and cap. of Cochin-China, on Saigon R., 35 mi. from sea; pop. 65,000; exports rice.

**Sail-fish, 3423.**

**Sailing vessels, 3208–10, 3212;** canoes, **442;** yachts, **444–5.**

**Sailor's Creek, battle of.** Severe engagement 45 mi. w. of Petersburg, Va., during Confederate retreat before Lee's surrender at Appomattox (1865).

**Saima** (*sī'mà*), lake in s.e. Finland, **1248.**

**St. Albans** (*ąl'bănz*), England, city 20 mi. n.w. of London; pop. 18,000; near old Rom. Verulamium; fine Norman abbey church, now cathedral; battle (1455), **3068.**

**St. Albans,** Vt. City in n.w., 3 mi. from L. Champlain; pop. 7588; farming and dairying district; flour, machinery, clothing.

**St. Andrews,** Scotland, small port 40 mi. n.e. of Edinburgh; golf balls and clubs; famous golf links; **1486;** univ., **832.**

**St. Andrews, University of,** at St. Andrews, Scotland; co-ed.; founded 1411; faculties of philosophy, law, medicine, theology; **832.**

**St. Andrew's cross, 157;** on Brit. flag, **1287.**

**Ste. Anne de Beaupré** (*sănt ăn dē bō-prā'*). Village and pilgrim resort on St. Lawrence R. 20 mi. below Quebec; pop. 2500; famous shrine of Ste. Anne, which thousands visit annually; church burned and rebuilt 1922.

**St. Anthony Falls,** in Mississippi R.; Hennepin discovers, **1632;** water-power, **2252,. 2256.**

**St. Au'gustine,** Fla., on e. coast; oldest permanent European settlement in U.S.; pop. 6192; **3106–7.**

**St. Barthol'omew, Massacre of,** massacre of Huguenots commencing in Paris Aug. 24, 1572, **826, 1696.**

**St. Bernard' Pass, Great,** famous Alpine pass (8100 ft.) connecting Rhone valley with Aosta, Italy, **102.**

**St. Bernard Pass, Little.** Alpine pass (7180 ft.) in Italy s. of Mont Blanc; connects valleys of Dora Baltea and Iserc.

**St. Bernard dog, 1018, 1023,** *pictures,* **1018, 1022.**

**Sainte-Beuve** (*sănt-bûv'*), **Charles-Augustin** (1804–69). Fr. literary critic, exceptionally able and fair ('Causeries de Lundi').

**St. Boniface,** Manitoba. Mfg. and r.r. city on Red R. opposite Winnipeg; pop. 14,000; packed meat, lumber, brick, flour, iron products; St. Boniface College.

**St. Catherine, College of.** At St. Paul, Minn.; women; Rom. Cath.; founded 1905.

**St. Catharines,** Ontario. Industrial city on Welland Canal, 12 mi. n.w. of Niagara Falls; pop. 20,000; iron and steel products, paper, electrical equipment, auto parts, textiles; fruit interests.

**Sainte Chapelle** (*sănt shà-pĕl'*), church in Paris, **2684.**

**St. Charles,** Mo., city on Missouri R. 14 mi. n.w. of St. Louis; pop. 8503; large car works and grain elevators; formerly state cap., **2272.**

**St. Charles River,** in Boston, **470,** *picture,* **833.**

**St. Christopher** or **St. Kitts.** A mountainous isl. of Brit. W. Indies separated by narrow channel from Nevis; one of Leeward Isls.; 65 sq. mi.; pop. 26,000.

**St. Clair, Gen. Arthur** (1734–1818). Amer. statesman, b. Thurso, Scotland; served as general in Rev. War; pres. Continental Congress 1787; first gov. of Northwest Territory (1789–1802).

**St. Clair, Lake,** on Michigan-Ontario border, between L. Huron and L. Erie; 396 sq. mi.; **1514.**

**St. Clair River,** outlet of L. Huron, flowing 41 mi. s. on Michigan-Ontario border to St. Clair L., **1514.**

**St. Clements,** church in London; bell tower, *picture,* **378.**

**Saint-Cloud** (*săn klų*), France, town 5 mi. w. of Paris, **2685, 2883.**

**St. Cloud,** Minn. City on Mississippi R. 65 mi. n.w. of Minneapolis; pop. 15,873; ships granite quarried near by; iron and lumber products, farm machinery, flour, paper.

**St. Croix** (*kroi*) or **Santa Cruz,** one of Virgin Isls. (U.S.); 85 sq. mi.; pop. 15,000; chief town, Christiansted; raises cane and cattle; **3651.**

**St. Croix River,** a stream 75 mi. long, part of boundary between U.S. and Canada, **2129.**

**St. Croix River,** Wis., tributary of Mississippi, 200 mi. long, **3770.**

**Saint-Cyr-l'Ecole** (*săn-sēr-lā-kōl'*), France, village n.w. of Versailles; famous for military school established (1806) in convent which housed Mme. de Maintenon's girls' school, 1686–1793; **2129.**

**Saint-Denis** (*săn dĕ-nē'*). France, suburb of Paris on Seine R.; pop. 72,000; abbey church (12th cent.); metallurgical and chemical industries; **2685.**

**St. Dunstan's College.** At Charlottetown, Prince Edward Island; men, Rom. Cath.; founded 1855; classics, arts, commerce.

**St. Eli'as, Mt.,** Alaska, snowclad peak (18,024 feet) in St. Elias Range, near Pacific coast, 325 mi. n.w. of Sitka; Malaspina Glacier on s. slope; **77,** *map,* **75.**

**St. Elizabeth, College of.** At Convent Station, N.J.; women, Rom. Cath.; founded 1899.

**St. Elmo Castle,** Naples, Italy, **2390.**

**St. Elmo's Fire, 2007.**

**Saint-Etienne** (*săn-tā-tyĕn'*). France, industrial city 3 mi. s.w. of Lyons; pop. 150,000; near rich coal fields; firearms, iron products, silks; **1348.**

**St. Eusta'tius** or **Eustache.** Volcanic isl. in Dutch W. Indies; 8 sq. mi.; pop. 1400; chief town, Orangetown; source of supplies for Continental army in Rev. War; captured by Brit. fleet 1781.

**St. Francis River,** a tributary of the Mississippi in s.e. Missouri and Arkansas; 450 mi. long; *map,* **2270.**

**St. Francis Xavier College.** At Brooklyn, N.Y.; men, Cath. (Jesuit); founded 1847; arts and science; college department transferred 1913 from New York City to Brooklyn College, Brooklyn.

**St. François Xavier, University of.** At Antigonish, Nova Scotia; men, Rom. Cath.; founded 1854; arts, science, engineering, law.

**Saint-Gall** (*săn-gäl*) or **St. Gallen** (*gäl'lĕn*), mfg. town in n.e. Switzerland 40 mi. e. of Zurich; pop. 70,000; famous embroideries, laces; celebrated library; **3416.**

**Saint-Gaudens** (*săn't-gą'dĕnz*), **Augustus** (1848–1907), Amer. sculptor, **3107, 3164;** statue of Lincoln, *picture,* **3161.**

**St. George,** one of the Bermuda Isls., 3½ mi. long, **386.**

**St. George and the Dragon, 1027–8.**

**St. George's Channel.** Strait 100 mi. long and 60 to 100 mi. wide connecting Atlantic and Irish seas and separating Ireland from Wales.

**St. George's cross, 1287.**

**Saint-Germain-en-Laye** (*săn-zhĕr-măn'-ŏn-lā*), France. Summer resort on Seine R., 11 mi. w. of Paris; pop. 18,000; treaty between Allies and Austria signed here after World War.

**Saint-Germain, Treaty of,** between Allies and Austria (1919), **269, 3811–2, 3642.**

**St. Giles' Church,** Edinburgh, **1080.**

**St. Gotthard** (*gŏth'ärd*), group of Alps, Switzerland; highest points over 10,000 ft.; **3413, 3414.**

**St. Gotthard Pass,** over Swiss-Italian Alps; long the chief route from n. Europe to Italy; **102.**

**St. Gotthard Tunnel, 3552, 3413.**

**St. Hele'na,** Brit. volcanic isl. in Atlantic 1200 mi. w. of Africa; 47 sq. mi.; pop. 3500; declining importance as port of call; Napoleon exiled to, **2396.**

**St. Helens.** Town of Lancashire, England, 10 mi. n.e. of Liverpool; pop. 105,000; plate glass, copper products, bottles, patent medicines; coal trade.

**St. Helens, Mt.,** volcanic peak of Cascade Range, in Wash., 60 mi. n.e. of Portland; 10,000 ft.; **3687.**

**St. Hyacinthe,** Quebec. City 35 mi. n.e. of Montreal on Yamaska R.; pop. 11,000; knit goods, organs, agricultural machinery.

**St. Ig'nace,** Mich., summer resort on a bay of L. Huron near Strait of Mackinac; pop. 1852; **2151.**

**St. Isaac's Cathedral,** Petrograd, Russia, *picture,* **3093.**

**St. Ives.** Seaport and winter resort in Cornwall, 57 mi. s.w. of Plymouth; pop. 7000.

**Saint-Jean** (*săn-zhăn*), **Isle of,** Fr. name of Prince Edward Isl., **2915.**

**St. John,** New Brunswick, chief winter port of Canada, on Bay of Fundy; pop. 48,000; **3107, 2449;** falls, *picture,* **609.**

**St. John,** one of Virgin Isls. (U.S.); 20 sq. mi.; pop. 1000; sugar cane; noted for bay oil; **3651.**

**St. John, Knights Hospitalers of, 932, 2131, 3541.**

**St. John Lateran,** church in Rome, first built 3d cent.; destroyed by earthquake and fire and subsequently rebuilt 4 times, the last time in 14th cent.; in part reconstructed and modernized several times since; **662.**

**St. John River,** New Brunswick, rises on boundary between Maine and Quebec, flows across New Brunswick 550 mi. to Bay of Fundy; "reversing" falls, **3107,** *picture,* **609.**

**St. Johns,** Newfoundland, cap. and shipping point on e. coast; nearest point in America to Europe; pop. 35,000; large export and import trade and various mfrs.; founded 1582; captured by French in 1696 and during Seven Years' War; ceded to British 1763; **2450;** cable. **560.**

**St. Johns** or **St. Jean,** Quebec. Town 27 mi. s.e. of Montreal on Richelieu R.; pop. 10,000; lumber and grain trade sewing machines, silks, silk thread, furniture, pottery, wax tapers.

**St. John's bread,** pods of the carob tree, **2045.**

**St. Johnsbury,** Vt. Town on Passumpsic R. 30 mi. n.e. of Montpelier; pop. 7164; Fairbanks Scales Works; center of dairying dist.; maple sugar market.

**St. John's College.** At Annapolis, Md.; men, non-sect.; chartered 1784 (successor to King William's School, founded 1696); arts and science, engineering; George Washington's school.

**St. John's College.** At Brooklyn, N.Y.; men, Rom. Cath.; founded 1870; classics, science, commerce, pre-medical.

**St. John's College,** Oxford, founded, **2610,** *picture,* **2609.**

**St. Johns River,** Fla., principal r. of state; flows through many lakes and is several mi. wide in places; 300 mi. long; **1858, 1298, 1297.**

**St. John the Divine,** cathedral in New York City, **2491, 662.**

**St. Joseph,** Mo., 48 mi. n. of Kansas City on Missouri R., live stock market, immense yards and packing houses; pop. 77,939; grain, dairy, and milling products, candy, clothing, etc.; **2272;** on overland trail, **582, 2274.**

**St. Joseph River,** in n. Ind. and Mich.; flows 200 mi. to L. Michigan at St. Joseph; **1758,** *map,* **2226.**

**St. Joseph's College.** At St. Joseph, New Brunswick; men, Rom. Cath.; founded 1864; arts and science.

**Saint-Just** (*săn-zhüst'*), **Antoine de** (1767–94), Fr. revolutionist, associate of Robespierre and Danton; organizer of the Reign of Terror; denounces Danton. **961;** arrested and guillotined, **3028.**

**St. Kitts.** Same as **St. Christopher.**

**St. Lawrence, Gulf of,** inlet of n. Atlantic at mouth of St. Lawrence R., **3108,** *map,* **602–3.**
**St. Lawrence Island,** an Alaskan isl. in Bering Sea, inhabited by Eskimos; 100 mi. long; *map,* **2514–5.**
**St. Lawrence River,** one of chief rivers of N. Amer., outlet of the Great Lakes; 775 mi. long from L. Ontario to Gulf of St. Lawrence; **3107–9,** *map,* **602–3;** canals, **627;** Cartier's explorations, **651–2;** Champlain, **687, 3109;** commerce, **2949, 2582, 2947, 2317, 2604;** "lakes to Gulf deep waterway," **1511;** why it has no floods, **3023.**
**St. Lawrence University.** At Canton, N.Y.; co-ed.; chartered 1856 (opened 1858); letters and science, law, theology (Universalist), New York State School of Agriculture.
**St. Louis,** Mo., largest city of state and chief market for Mississippi valley; near junction of Mississippi and Missouri rivers; pop. 772,897; **3109–10;** early river trade, **2268;** great fire, **1262;** why called "Mound City," **2357.**
**St. Louis University.** At St. Louis, Mo.; men, Cath. (Jesuit); founded 1818 (university since 1832); liberal arts, commerce, military science, normal school, philosophy, science, divinity, medicine.
**St. Lucia.** Largest of the Windward Isls., 233 sq. mi.; pop. 55,000; sugar, cocoa, lime juice, molasses, bay oil.
**Saint-Malo** (*săn-mä-lō'*), fortified seaport and bathing resort of France on English Channel; shipbuilding and other mfrs.; pop. 12,000; associated with Cartier, **651, 652.**
**St. Marks,** Fla., village on St. Marks R. near the Gulf; captured by Jackson, **1856.**
**St. Mark's,** cathedral in Venice, **1851–2, 3623–4,** *pictures,* **1197, 182;** bell-tower, **377,** *pictures,* **182, 1851.**
**St. Martin.** An isl. of the Lesser Antilles; the n. portion (20 sq. mi.) belongs to France and the s. portion (17 sq. mi.) to the Dutch colony of Curaçao.
**St. Martin's-in-the-Fields,** church in London, *picture,* **2052.**
**St. Mary Magdalen** (*mag'lĭn*) **College,** Oxford, founded, **2610;** tower, *picture,* **2608.**
**St. Mary of the Woods College.** At Terre Haute, Ind.; women, Rom. Cath.; founded 1840; arts and science, home economics, music.
**St. Mary Redcliffe,** famous old church in Bristol, England, **510.**
**St. Marys,** Md., first settlement and early cap. of state., on St. Marys R., 55 mi. s. of Annapolis; founded 1634; **2163.**
**St. Marys River,** Ga., r. rising in Okefenokee Swamp and forming part of the boundary between Georgia and Florida; 175 mi. long; *map,* **1432.**
**St. Marys Strait** or **River,** channel connecting L. Superior and L. Huron, **3129, 1513.**
**St. Maurice River,** Quebec, tributary of the St. Lawrence; 350 mi. long; Shawenegan Falls, *picture,* **2947.**
**St. Michaels Island,** largest of Azores; 300 sq. mi.; pop. 116,000; chief city, Ponta Delgada; **288.**
**Saint-Mihiel** (*săn-mē-yĕl'*), town in n. France, 20 mi. s. of Verdun on Meuse R.; World War battles, **3110, 3806, 3810,** *picture,* **3802–3.**
**St. Moritz** (*mō'rĭts*), Switzerland, loftiest village in Upper Engadine, on L. Moritz; mineral springs; popular for winter sports; **3417.**
**Saint-Nazaire** (*săn-nä-zêr'*), France, port of disembarkation for Amer. troops in World War; at mouth of Loire R.; pop. 38,000; **3110–1, 2047.**
**Saint-Nicolas** (*săn-nē-kō-lä'*), Belgium, trade and mfg. center, 12 mi. s.w. of Antwerp; pop. 35,000.
**St. Olaf College.** At Northfield, Minn.; co-ed., Lutheran; founded 1874 (college from 1886); arts and science, music, commerce, domestic economy.
**Saint-Ouen** (*săn-twän'*), France, Suburb n. of Paris on Seine R.; pop. 42,000; river port and mfg. center.
**St. Patrick's cross, 1287.**
**St. Patrick's Day, 2694, 2695, 3195.**
**St. Paul,** Minn., state cap., on Mississippi R.; pop. 234,698; **3111, 2256;** capitol, *picture,* **2255;** Mississippi R. dam, **2268.**
**St. Paul** or **St. Paul's Rocks,** tiny isl. in cent. Atlantic just n. of equator, **254.**
**St. Paul de Loanda.** *See in Index* **Loanda.**
**St. Paul's,** cathedral in London, **2052,** *pictures,* **2048, 2051;** famous bell, **379;** whispering gallery, **3278.**
**St. Paul's School.** Famous boys' preparatory school at Concord, N.H., founded 1855; Prot. Episc.; publishes *Horae Scholasticae,* oldest school paper in U.S.
**St. Peter's,** cathedral in Rome, **3052, 3054,** *picture,* **187;** Julius II improves, **1902;** dome designed by Michelangelo, **2222.**
**St. Petersburg,** Fla., popular winter resort on Tampa Bay, with beautiful beach and excellent harbor; pop. 14,237; **1300.**
**St. Petersburg,** Russia. *See in Index* **Petrograd.**
**Saint-Pierre** (*săn-pyêr'*), **Bernardin de** (1737–1814), Fr. writer, **1365.**
**Saint-Pierre,** formerly the chief town of Martinique, **2156.**
**Saint-Pierre and Miquelon.** Fr. colony consisting of several barren rocky isls. 10 mi. off s. coast of Newfoundland; 93 sq. mi.; pop. 5000; important codfishing center.
**Saint-Quentin** (*săn-kăn-tăn'*), city in n. France on Somme R., 95 mi. n.e. of Paris, scene of several fierce battles in World War; former pop. 56,000; **3111.**
**St. Roque** (*rōk*), **Cape,** promontory on n.e. coast of Brazil, **256.**
**Saint-Saëns** (*săn-sà-ôn'*), **Charles Camille** (1835–1921), Fr. musical composer; chief works, **2381.**
**Saintsbury, George Edward Bateman** (born 1845). Eng. literary critic and historian ('A History of Criticism'; 'A History of English Prosody'; 'Nineteenth Century Literature').
**Saint-Simon** (*săn-sē-môn'*), **Claude Henri de Rouvroy, Comte de** (1760–1825), founder of Fr. socialism, **3268.**
**St. Sophia** (*sō-fē'ȧ*), famous mosque at Constantinople, **178,** *pictures,* **182, 183;** columns, **3178;** Justinian I builds, **1905;** taken by Turks, **552.**
**St. Stephen's College.** At Annandale, N.Y.; men, Prot. Episc.; founded 1860; classical, literary, and scientific courses.
**St. Stephen's Tower,** Houses of Parliament, London, *picture,* **2049.**
**St. Sulpice** (*sül-pēs'*), **Seminary of,** at Montreal, Canada; Rom. Cath. theological school affiliated with Laval Univ.; **2317.**
**St. Teresa, College of.** At Winona, Minn.; men, Rom. Cath.; founded 1894.
**St. Thomas** (formerly Charlotte Amalie). Chief port of Amer. Virgin Isls., at head of St. Thomas Harbor, Isl. of St. Thomas; pop. 8000.
**St. Thomas** or **São Thomé** (*tō-mā'*). Port. isl. in Gulf of Guinea, 270 mi. s. of mouth of Niger R.; forms province (360 sq. mi.) with isl. of Principe; pop. 60,000; exports coffee, cacao, rubber, cinchona.
**St. Thomas,** one of Virgin Isls. (U.S.); 28 sq. mi.; pop. 11,000; **3651.**
**St. Thomas,** Ontario. Industrial and r.r. center 15 mi. s. of London and 8 mi. n. of L. Erie; pop. 20,000; ships farm products and fruit; large r.r. shops; iron and steel products, shoes, woolen goods, wooden ware.
**St. Thomas, College of.** At St. Paul, Minn.; men, Rom. Cath.; founded 1885.
**St. Valentine's Day, 3111.**
**Saint-Valery-sur-Somme** (*săn-vä-lē-rē'-sür-sōm*), small port of France, **3275.**
**St. Vincent.** Brit. isl. of Windward group, W. Indies; 150 sq. mi.; pop. 42,000; cap. Kingstown, on s.w. coast.
**St. Vincent.** Port. isl. of Cape Verde group, off n.w. coast of Africa; 75 sq. mi.; cable station.
**St. Vincent, Cape.** Promontory on s.w. extremity of Portugal extending into Atlantic Ocean; Brit. fleet under Jervis and Nelson defeated Span. fleet 1797.
**Sair,** a wild sheep, **3199.**
**Sakais** (*sä'kīz*), a race of the Malay Peninsula, **2130.**
**Sake** (*sä'kē*), national drink of Japan, **3015.**
**Sakhalin** (*sä-kä-lēn'*), long mountainous isl. near e. coast of Siberia; 27,800 sq. mi; pop. 140,000; s. part (Karafuto) ceded to Japan by Russia (1905); heavy forests, fisheries; **1863, 1870,** *map,* **1864.**
**Saki** (*sä'kē*), a S. Amer. monkey, **2291,** *picture,* **2289.**
**Sakkara** (*säk-kä'rä*), Egypt. village near Nile R., 15 mi. s.w. of Cairo; pyramids, **568.**
**Sal'adin** (1138–98), chivalrous Mohammedan leader, sultan of Egypt and Syria, **3111–2, 956;** and Crusaders, **930, 3426;** introduced chinaware to West, **2881;** and Richard I, **3015.**
**Salaman'ca,** old Span. city 110 mi. n.w. of Madrid; pop. 33,000; anc. Salmantica, captured by Hannibal; beautiful medieval buildings; Wellington defeated French in Peninsular War; **3300;** univ., **832.**
**Sal'amander,** an amphibian, **3112–3.**
**Salamis** (*săl'ȧ-mis*), Greece, barren mountainous isl. in Gulf of Aegina; 36 sq. mi.; famous for defeat of Persian fleet by Greeks in strait between isl. and Attic coast (480 B.C.); Athens captures, **3274.**
**Salamis, battle of, 2740, 3113, 2426;** Aristides at, **195.**
**Sal ammo'niac,** or ammonium chloride, **118, 3272;** chemical experiment, **712.**
**Salamvri'a** or **Salambria River.** Same as **Peneus.**
**Sal'ary,** derivation of word, **3116.**
**Salayer** (*sä-lī'ĕr*) or **Saleyer Islands.** A fertile group in the Dutch E. Indies s. of Celebes; 270 sq. mi., of which 250 sq. mi. are occupied by Salayer Isl.; pop. of group 81,000; timber, tobacco, potatoes, indigo, and cotton.
**Sa'lem,** Mass., historic city 13 mi. n.e. of Boston on Atlantic; pop. 42,529; clipper trade, **2166, 233;** founded, **2164;** Hawthorne associations, **1607;** origin of name, **2165;** Roger Williams expelled, **3742;** witchcraft persecutions, **3774.**
**Salem,** Ohio. City 62 mi. s.e. of Cleveland; pop. 10,305; coal-mining, farming, and stock-raising region; iron and steel products, furniture; station on 'underground railroad' before Civil War.
**Salem,** Ore., cap., 43 mi. s. of Portland on Willamette R.; pop. 17,679; farm trade; flour, lumber, paper, woolen goods, canned fruit; Willamette Univ.; capitol, *picture,* **2595.**
**Salem,** Va. Tobacco- and apple-growing center on Roanoke R., 8 mi. w. of Roanoke; pop. 4159; Roanoke College; medicinal springs.
**Salera'tus,** sodium bicarbonate, **3271, 3272.**

**Salerno** (*sä-lĕr'nō*), Italy, port on Gulf of Salerno; pop. 48,000; textiles; famous medieval medical school and univ., **832, 2390.**
**Sal'ford,** England. Borough of Lancashire, practically a suburb of Manchester; pop. 236,000; cotton, iron, chemicals.
**Sa'lian line** of Ger. emperors, **1447, 1675.**
**Salicin** (*săl'ĭ-sĭn*), drug obtained from willow, **3743.**
**Salic** (*săl'ĭk*) **law, 1699.**
**Salicylic** (*săl-ĭ-sĭl'ĭk*) **acid,** a drug, **1042;** antiseptic properties, **151;** made from carbolic acid, **814.**
**Sali'na,** Kan. Railroad city on Smoky Hill R., 105 mi. w. of Topeka; pop. 15,085; ships grain; flour and paper mills.
**Salina Cruz,** Mexico, Pacific port on Gulf of Tehuantepec; pop. 6000; **2209.**
**Salisbury** (*sąlz'bĕr-ĭ*), **Robert A. T. Gascoyne-Cecil,** 3d **Marquis of** (1830–1903), Brit. conservative statesman; premier 1885–86, 1886–92, 1895–1902; descendant of Queen Elizabeth's great minister, Burleigh; advises Victoria, **3640;** imperialistic policy, **2869.**
**Salisbury,** England. Town on Avon R., 80 mi. s.w. of London; pop. 22,000; one of finest cathedrals in England; formerly known for woolens and cutlery; trade center.
**Salisbury,** N.H., town 15 mi. n.w. of Concord; pop. 390; birthplace of Webster, **3710.**
**Salisbury,** N. C. City 110 mi. w. of Ralcigh; farming and mining region; pop. 13,884; tobacco, foundry products, machinery, tanned leather, textiles.
**Salisbury Plain,** high rolling plain in Wilts, England, n of Salisbury; Stonehenge, **3361.**
**Sali'va, 1469,** *picture,* **2793;** contains ptyalin, **1173;** function in digestion, **1010–1.**
**Sal'lust** (Caius Sallustius Crispus) (86–34 B.C.), first Rom. historian as distinguished from annalists, **1967.**
**Salmon** (*săm'ŏn*), a food fish, **3113–4, 1279;** in Alaska, **74;** in Brit. Columbia, **512,** *pictures,* **1284;** canning, **3114, 1286;** eggs, *picture,* **1091;** govt. protection, **1282;** U. S. fisheries, **1285–6, 3687–8.**
**Salmon Falls,** in Snake R., in s. Idaho; power plant, **1725.**
**Salmonidae** (*săl-mŏn'ĭ-dē*), the salmon family of fishes, **3114;** trout, **3545;** whitefish and cisco, **3733.**
**Salmon River,** Idaho, tributary of the Snake; 450 mi. long; *map,* **1726.**
**Salmon River Range,** in cent. Idaho, **3036,** *map,* **1726.**
**Salmon trout, 3545.**
**Salome** (*sä-lō'mĕ*), daughter of Herodias, who bade her ask of Herod the head of John the Baptist, **1645;** opera, **2584, 3370.**
**Saloniki** (*säl-ō-nē'kē*) or **Salonica,** 2d largest city of Greece and chief port of n. Aegean; pop. 250,000; **3114–5;** in World War, **3625, 3806.**
**Salons** (*sä-lôn'*), influence on French literature, **1364.**
**Saloons.** *See in Index* **Prohibition.**
**Sal'sify** or **oyster plant,** a biennial of the chicory family cultivated for its long white delicately flavored roots; when and how to plant, **1397.**
**Sal soda,** sodium carbonate, **3271.**
**Salt** or **sodium chloride,** common salt, **3115–6,** *picture,* **3117;** associated with gypsum, **1555;** Carpathian deposits, **647;** chemical nature, **714, 715, 755;** crystal, *picture,* **935;** freezing point of salt solution, **1362;** in glazing pottery, **2905;** Great Salt Lake, **1515;** in human body, **2792;** in Leblanc soda-making process, **3271–2;** in Louisiana, **2070;** mine, *picture,* **2249;** in New Mexico, **2464;** in ocean, **2554;** Texas, **3474.**
**Salt,** in chemistry, **8, 10, 3115–6, 4043;** borax, **464, 970;** mineral salts in food, **1320, 1321;** of potassium, **2898–2900, 10;** in soap-making, **3263;** of sodium, **3271–2;** Syracuse, N.Y., **3425.** For salts of the important elements *see in Index* the element, as **Aluminum,** by name.
**Salta** (*säl'tä*). City in n. Argentina, 800 mi. n.w. of Buenos Aires; pop. 29,000; on r.r. to Bolivia; growing commercial center.
**Salt cake,** sodium sulphate, **3272.**
**Salter, Mrs. Samuel, 3493.**
**Saltillo** (*säl-tēl'yō*). Trade center in n.e. Mexico, cap. of Coahuila state; pop. 36,000; textile mfrs., flour; altitude 5200 ft.
**Salt Lake City,** Utah, state cap. and leading commercial city; pop. 118,110; **3116, 3118;** capitol, *picture,* **3611;** founded by Mormons, **2327;** monument to gulls, **1550;** state univ., *picture,* **3611.**
**Salt Lake State, 3609.**
**Salto** (*säl'tō*), Uruguay. City on Uruguay R., 250 mi. n.w. of Montevideo; pop. 30,000; shipping point for stock-raising dist.
**Salton Sea,** lake in Imperial valley, S. Calif., **845,** *map,* **578;** date palm culture, **966.**
**Saltpeter** or **niter,** potassium or sodium nitrate, **3118;** Chilean industry, **736;** in gunpowder, **1552–3, 1212;** in making nitric acid, **2510;** preparation, *pictures,* **737, 2512.**
**Salt River,** Ariz., small tributary of the Gila, *map,* **201;** cotton-raising, **3588;** Roosevelt Dam, **1829, 202,** *pictures.* **200, 1830.**
**Salt sage,** a desert plant, **3104.**
**Saltus, Edgar** (1858–1921). Amer. novelist ('The Truth about Tristrem Varick'; 'Eden'; 'The Pace that Kills'; 'The Paliser Case').
**Salvador** (*säl-vä-dōr'*), **Republic of,** smallest of Cent. Amer. republics; 13,150 sq. mi.; pop. 1,300,000; cap. San Salvador; **3118–9, 679–80;** *maps,* **680, 2514–5.**
**Salvation Army, 3119–20.**
**Salvator Rosa.** *See in Index* **Rosa.**
**Salvini** (*säl-vē'nē*), **Tommaso** (1829–1915). Ital. tragedian, a great 'Othello'; played with Ristori and Booth.
**Sal volatile,** ammonium carbonate, **118.**
**Salween'** or **Salwin,** river of S. Asia; rises in s.e. Tibet and flows 1750 mi. s., principally through Burma, to Gulf of Martaban; *map,* **1744;** logging, **3226.**
**Salzburg** (*zälts'bŭrĸ*), Austria, city beautifully situated in Salzburg Alps, near Ger. frontier; pop. 37,000; cap. of Salzburg province (2760 sq. mi.; pop. 214,000); castle, cathedral, and many other fine buildings; home of Mozart, **2363.**
**Salzburgers,** Ger. Lutheran immigrants to Georgia, **1434.**
**Samara** (*sä-mä'rä*). Port of e. Russia on Volga and Samara rivers 525 mi. s.e. of Moscow; pop. 144,000; flour milling; extensive trade in grain, flour, tallow, hides, wool, horses, fish.
**Samaria** (*sȧ-mā'rĭ-ȧ*), anc. city of Palestine, 35 mi. n. of Jerusalem; became cap. of Israel 9th cent. B.C.; captured by Assyrians, **1890;** World War battle, **3810.** Name also applied to region of cent. Palestine occupied by Samaritans.
**Samar'itans,** a people of Palestine, **1890,** *picture,* **2644.**
**Sama'rium,** a chemical element, **4042.**
**Samarkand** (*sä-mär-känd'*), Turkestan, important trading city 130 mi. e. of Bokhara; pop. 98,000; anc. Marcanda; famous medieval center of learning; **3555, 3556.**
**Sambre** (*säⁿbr*), river in n.e. France and Belgium; rises 120 mi. n.e. of Paris and flows 100 mi. n.e. to Meuse at Namur, **2207.**
**Sam'nites,** anc. warlike tribes inhabiting mountainous portions of s. half of Italy; wars with Rome, **3044.**
**Samoa** (*sä-mō'ä*), chain of isls. in S. Pacific, in a direct line between San Francisco and Australia; formerly called Navigator Isls.; over 1000 sq. mi.; pop. 52,000; **3120–1,** *pictures,* **2622, 2618, 2623;** Germany attempts to seize, **1592;** Stevenson in, **3356.**
**Samos** (*sā'mŏs*), small Gk. isl. in Aegean near coast of Asia Minor; pop. 69,000; flourished 6th cent. B.C.; famous temple of Hera; exports wine, raisins; colonized by Greeks, **1520.**
**Sam'oset,** Amer. Indian chief, friend of Pilgrim colonists at Plymouth, **2841.**
**Sam'othrace,** small mountainous Gk. isl. in n. Aegean; 'Winged Victory' found here 1863, now in Louvre; colonized by Greeks, **1520.**
**Samp** or **hominy, 890.**
**Sam'pans,** Chinese house-boats, **230,** *picture,* **745.**
**Samp'son, William Thomas** (1840–1902), Amer. rear-admiral; commander of U.S. fleet which destroyed Span. fleet 1898 at Santiago de Cuba; **3306.**
**Sam'son.** Hebrew judge and hero; shorn of strength by Delilah and enslaved and blinded by Philistines; grew strong again with the growth of his hair and pulled down the house on his enemies' heads and his own (Judges xiii-xvi).
**'Samson Agonistes',** tragedy by Milton, **2243.**
**Sam'uel,** last of Hebrew judges; anointed Saul and David (I Samuel); gave name to 9th and 10th books of Old Testament, which contain the history of Israel from the birth of Samuel to the death of David; **1890;** meaning of name, **2388.**
**Samurai** (*sä'mų-rī*), feudal warriors of Japan, **1868.**
**San An'gelo,** Tex. City 170 mi. w. of Austin; pop. 10,050; wool market, center of stock-raising region; health resort.
**San Anto'nio,** Tex., largest and oldest city of state; pop. 161,379; mfg. center and distributing point for s.w. Texas and n. Mexico; **3121;** battle of the Alamo, **3478,** *picture,* **3473.**
**San Antonio River,** in Texas, flows 200 mi. into Gulf of Mexico, **3476.**
**San Bernardi'no,** Calif. Commercial city and health resort 55 mi. e. of Los Angeles; pop. 18,721; ships fruit, grain, lumber; r.r. shops, lumber mills.
**San Blas** (*sän bläs*), Mexico, seaport on Pacific coast, **2209.**
**San Carlo,** celebrated opera house in Naples, **2390, 3484.**
**San'chi,** small village in India on Bombay-Baroda r.r., famous for old Buddhist memorial mounds (topes); gate, *picture,* **1753.**
**Sancho** (*sän'kō*) **Pan'za,** squire in Cervantes' 'Don Quixote', **683–4;** quoted, **3251.**
**Sancti Spiritus** (*sänk'tē spē'rē-tųs*), Cuba. City 20 mi. from s. coast; pop. 59,000; foundcd 1515.
**Sand, George,** pen name of Amandine Lucile Aurore Dupin, Baroness Dudevant (1804–76), Fr. novelist and feminist, **1365;** and Chopin, **757.**
**Sand, 3121–3;** in carborundum mfr., **3234;** carried by wind, **2788, 3750;** contains silicon, **3233;** in glassmaking, **1471;** in water filtration, **3703.** *See also in Index* **Deserts; Dunes.**
**Sandal, 3220.**
**Sandalwood,** oriental tree, **3123.**
**Sandarach** (*săn'dă-răk*), a resin, **3619.**

**Sanday,** one of Orkney Isls., **2601.**
**Sandbags,** use in World War, **3123.**
**Sandblast, 3123.**
**Sand-box tree.** *See in Index* **Monkey's dinner bell.**
**Sand-bur** or **buffalo-bur, 2902.**
**Sand'burg, Carl** (born 1878). Amer. poet of the "free verse" school, b. Galesburg, Ill. ('Corn Huskers'; 'Smoke and Steel').
**San Diego** (*săn dē-ā'gō*), Calif., seaport and Pacific naval base; pop. 74,683; **3123–4, 580.**
**Sand-dollar,** a sea-urchin, **3345, 3170.**
**Sand dunes.** *See in Index* **Dunes.**
**Sanderling.** A snipe (*Calidris leucophaea*) about 8 in. long, distinguished by having only 3 toes; ranges from Arctic regions to S. Africa and the Pacific isls.; common on N. Amer. coasts; plumage white underneath, bluish ash above in winter and chestnut in summer; also called ruddy plover.
**Sand-glass** or **hour-glass, 797,** *picture,* **799.**
**Sandhill crane, 3365,** *picture,* **3364.**
**San Domen'ico,** church in Bologna, **450.**
**San Domin'go.** *See in Index* **Santo Domingo.**
**San Domingo coffee, 824.**
**Sandpiper,** a shore bird, **3261, 414;** nest on ground, **406;** upland plover, **2839.**
**Sand-shoes,** *picture,* **3799.**
**Sandstone,** sand cemented into rock, **3123, 1417.**
**Sandus'ky,** Ohio, port and r.r. city 55 mi. w. of Cleveland on Sandusky R. and Sandusky Bay, inlet of L. Erie; pop. 22,897; trade in coal, limestone, fruit; fisheries; farm tractors and marine airplanes, iron products, brick, glass; **2568, 2570, 1174.**
**Sand viper, 3647.**
**Sandwich, John Montagu, Earl of** (1718–92), Eng. politician, notorious for his personal and political vices; First Lord of the Admiralty 1771–82; invented sandwich, **1162.**
**Sandwich.** Small seaport in Kent, England, on Stour R.; one of Cinque Ports; important in Middle Ages.
**Sandwich Islands.** Same as **Hawaiian Islands.**
**Sandy Hook,** narrow sandy peninsula on New Jersey coast extending 6 mi. n. and partly enclosing New York Bay, **2488.**
**Sandys** (*săndz*), **Frederick** (1832–1904). Eng. painter of the Pre-Raphaelite group; much of his best work was in form of woodcuts; subjects usually taken from Norse mythology or medieval legend.
**San Felipe** (*săn fā-lē'pā*), Tex., colony established by Austin, **261.**
**Sanford,** Me. Town on Mousan R., 30 mi. s.w. of Portland; pop. 10,691; abundant water-power; shoes, woolens, and worsteds.
**San Francisco,** Calif., most important Pacific port of U.S. and world's greatest land-locked harbor; pop. 506,676; **3124–5, 585, 580;** earthquake and fire of 1906, **3124, 1066, 1065;** Golden Gate, *picture,* **576.**
**San Francisco Mountain,** Ariz., **3658, 199.**
**San Francisco River.** *See in Index* **São Francisco River.**
**San'gamon River,** crooked stream flowing 250 mi. across cent. Illinois to the Illinois R., **1731, 3331.**
**Sangre de Cristo** (*săn'grā dā krēs'tō*) **Mts.,** lofty range in s.-cent. Colorado and n. New Mexico, **842, 2466,** *map,* **840.**
**Sangster, Charles** (1822–93), Canadian poet, **623.**
**Sangster, Margaret** (1838–1912), Amer. journalist and author of juvenile books; editor *Harper's Bazaar* 1889–99; staff contributor to *Ladies' Home Journal* from 1899 until her death; quoted, **116.**
**San'hedrin,** the supreme judicial council of the anc. Jews, **1888.**
**San Ildefonso** (*săn ēl-dā-fŏn'sō*) or **La Granja,** Spain. Town 34 mi. n.w. of Madrid; splendid palace built by Philip V; secret treaty between Napoleon and Spain (1800) ceded Louisiana to France.
**Sanita'riums, 1688.**
**Sanita'tion,** in camps, **595;** in the home, **1715–6;** in Panama, **2651–4, 1490.** *See also in Index* **Public health.**
**San Jacinto** (*jā-sĭn'tō*), **battle of** (1836), between Texans and Mexicans in Texan war for independence, **1688, 3478,** *picture-map,* **3474.**
**'San Jacinto',** U.S. ship, **3539.**
**San Joaquin** (*wä-kēn'*) **River,** Calif., rises in Sierre Nevadas near Yosemite National Park, flows w. and n. to meet the Sacramento R. near its mouth, **576, 578, 581,** *map,* **577.**
**San José** (*hō-sā'*), Calif. City 45 mi. s.e. of San Francisco near San Francisco Bay; pop. 39,642; ships fruit of Santa Clara valley; fruit canneries and packing houses, various mfrs.; Lick Observatory is 13 mi. east.
**San José,** cap. and largest city of Costa Rica; pop. 52,000 (with suburbs); center of agricultural region; coffee trade; port on Pacific coast, **1546.**
**San José scale,** an insect parasite of plants, **3132–3.**
**San Juan** (*hu-ăn'*), cap. and chief port of Porto Rico, on n. coast; pop. 71,000; **2886–7.**
**San Juan Hill,** near Santiago, Cuba; capture by Amer. troops led to surrender of Santiago in Span.-Amer. War; **3306.**
**San Juan Island,** Wash., **3688, 3690.**
**San Juan Mts.,** range in s.w. Colorado; highest peak over 14,000 ft.; *map,* **840.**
**San Juan River,** Colombia, **836,** *map,* **835.**
**San Juan River,** a tributary of the Colorado in Utah; 350 mi. long, *map,* **3610.**
**Sankey, Ira D.** (1840–1908), Amer. singer, hymn-writer ('The Ninety and Nine'), and evangelist, b. Edinburgh, Pa., long associated with D. L. Moody, **2317.**
**San Luis** (*lu-ēs'*) **Park,** Colo., **841.**
**San Luis Potosi** (*pō-tō-sē'*), Mexico, state in e.-center; 24,004 sq. mi.; pop. 639,000; cap. San Luis Potosi; oil, **2211, 2212;** silver, **2210.**
**San Luis Potosi.** Commercial and r.r. center in Mexico, 225 mi. n.w. of Mexico City; pop. 68,000; mining region; immense silver-lead reduction works.
**San Luis Rey,** Calif., village 90 mi. s.e. of Los Angeles; mission, *picture,* **2301.**
**San Mar'co,** Venice. *See in Index* **St. Mark's.**
**San Mar'cos,** Tex., town 30 mi. s.w. of Austin; pop. 4527; agricultural region; Coronal Institute, San Marcos Baptist Academy; **3478.**
**San Marcos, University of, 2009.**
**San Marino** (*mä-rē'nō*), small republic in n. Italy, near Adriatic coast; 38 sq. mi.; pop. 11,000; **1842.**
**San Martin** (*măr-tēn'*), **José de** (1778–1850), S. Amer. patriot, general, and statesman; led famous expedition across Andes 1817; drove Spaniards from Chile; captured Lima, Peru, and proclaimed Peruvian independence 1821; **192, 3289.**
**San Pe'dro,** Calif., seaport of Los Angeles, annexed 1909; pop. 23,098; **2062, 2063.**
**San Remo** (*rā'mō*), Italy. Winter resort on Riviera, 75 mi. s.w. of Genoa, pop. 23,000; famous for mild climate; conference of Supreme Council of allied premiers (1920), which awarded mandates for Near East.
**San River,** in s.-cent. Poland; flows n.w. about 150 mi.; **3651.**
**San Roque** (*rō'kā*), **Rio de,** former name of Columbia R., **2596.**
**San Sal'vador,** cap. of Salvador, Cent. Amer., 25 mi. from coast; pop. 80,000; industrial and trade center, **3119.**
**San Salvador** or **Watling Island,** one of Bahamas; first Amer. land seen by Columbus, **305, 849.**
**Sansandig** (*săn-săn-dĭg'*), trading post of Fr. W. Africa; estimated pop. 30,000; **2507.**
**Sansculotte** (*săn-kü-lŏt'*), **900.**
**San Sebastian** (*sā-băs-tē-ăn'*), Spain, seaport, mfg. city, and fashionable watering place on Bay of Biscay, 12 mi. from France; pop. 58,000; *picture,* **1192.**
**San Sebastian River,** Fla., **3106.**
**San'skrit,** anc. Hindu language; literature, **1755–6;** relation to other languages, **1748, 2771, 224.**
**Sans Souci** (*săn sụ-sē'*), palace and royal park in Potsdam, **1360,** *picture,* **1442.**
**San Stefano** (*stā-fä'nō*), European Turkey, port on Marmora Sea; treaty ending Russo-Turkish War (1878), **3560, 310.**
**San'ta An'a,** Calif. City 30 mi. s.e. of Los Angeles in fruit, wheat, and vegetable-growing region; pop. 15,485; sugar-beet factories; canneries, woolen mills; oil, natural gas.
**Santa Ana,** 2d largest city of Salvador, Cent. Amer., 40 mi. n.w. of San Salvador; pop. 60,000; sugar trade; **3119.**
**Santa Anna** (*săn'tà ä'nà*), **Antonio Lopez de** (1795?–1876), Mexican general and intriguing politician, alternately dictator and banished rebel; abolished Mex. constitution, causing Texan revolt; **2214, 3478;** in Mex. War, **2208.**
**Santa Barbara,** Calif. Winter resort on Santa Barbara Channel, arm of Pacific, 90 mi. n.w. of Los Angeles; pop. 19,441; old mission (1786).
**Santa Catali'na Island,** Calif., **2063,** *map,* **578.**
**Santa Clara.** City in cent. Cuba; pop. 63,000; exports asphalt, graphite, tobacco.
**Santa Claus.** *See in Index* **Nicholas, Saint.**
**Santa Cruz** (*säu'tà krụs*), **Andres** (1794–1865). Bolivian patriot, general in war of independence, president 1829–39; failed in attempt at forcible federation of Peru and Bolivia.
**Santa Cruz,** Bolivia. Town on e. slope of Andes; pop. 26,000; rubber center; wireless station.
**Santa Cruz,** Calif. City on Monterey Bay and San Lorenzo R., 60 mi. s. of San Francisco; pop. 10,917; health resort; dairy products, poultry, cement, lime, and lumber.
**Santa Cruz,** Virgin Isls. *See in Index* **St. Croix.**
**Santa Cruz** or **Queen Charlotte Islands,** isl. group in Pacific Ocean just n. of New Hebrides; about 360 sq. mi.; discovered 1595; **2624,** *map,* **2624–5;** feather money, *picture,* **2283;** outrigger canoe, *pictures,* **443, 2620.**
**Santa Cruz de Teneriffe** (*tā-nā-rē'fā*), cap. and port of Canary Isls. on isl. of Teneriffe; pop. 82,000; coaling station, **628;** attacked by Nelson, **2435.**
**Santa Fe** (*fā*), Argentina. City on arm of Parana R. 95 mi. n. of Rosario; pop. 60,000; trade in hides, timber; shipbuilding; univ.
**Santa Fe,** N.M., cap. of state, on Santa Fe R., in mining and stock-raising region; pop. 7236; historic landmarks; **2466;** capitol, *picture,* **2467.**
**Santa Fe Baldy Peak,** N.M., **3036.**
**Santa Fe Trail,** early overland trade route to Santa Fe, N. M., **2466, 2273, 1909, 3024,** *map,* **3605.**

**'Santa Maria'** (*mä-rē'ä*), Columbus' flagship; compared with modern liner, **3207.**

**Santa Maria delle Grazie** (*dĕl'ā grä'dzē-ā*), convent in Milan, **2235.**

**Sant' Ambrogio** (*äm-brō'ji-ō*), church in Milan, **2235.**

**Santa Mon'ica,** Calif. Summer resort and residential city on Pacific about 15 mi. w. of Los Angeles; pop. 15,252.

**Santander** (*sän-tän-dêr'*), **Francisco de Paula** (1792–1840). Colombian statesman; fought under Bolivar in war for independence, twice elected vice-pres. of Colombia; ruled with wisdom during Bolivar's many absences; pres. of New Granada 1832–36.

**Santander,** Spain. Important seaport on Bay of Biscay; pop. 73,000; fisheries, shipyards; fine harbor; exports iron ore, paper, wine.

**Sant' Angelo** (*sänt än'jĕ-lō*), **Castle of,** or Hadrian's Tomb, Rome, **3057,** *pictures,* **3054, 3051.**

**Santarem** (*sän-tä-rän'*). River port in n.-cent. Brazil on Tapajos R. near its junction with Amazon; pop. 6000; controls rubber trade of region; agricultural colony of emigrants from s. U.S. near by; wireless station.

**Santa Ro'sa,** Calif., city 52 mi. n. of San Francisco; pop. 8758; fruit canning; Burbank at, **539.**

**Santa Sophia,** mosque. *See in Index* **St. Sophia.**

**Santayana** (*sän-tä-yä'nä*), **George** (born 1863). Span.-Amer. poet and philosopher, b. Madrid, Spain; taught philosophy at Harvard 1889–1911; after 1912 lived in Paris ('Sonnets and Other Poems'; 'The Life of Reason').

**Santee',** chief r. of South Carolina, formed by confluence of Congaree and Wateree; 180 mi. long; *map,* **3291.**

**Santi, Raphael.** *See in Index* **Raphael.**

**Santiago** (*sän-tē-ä'gō*), cap. of Chile, and largest S. Amer. city on w. slope of Andes; pop. 420,000; **3125, 738,** *pictures,* **736, 738.**

**Santiago Bay,** excellent landlocked harbor on s.e. coast of Cuba; Span. fleet destroyed in Span.-Amer. War; **3306.**

**Santiago de Compostela** (*kŏm-pōs-tä'lä*), Spain. City in extreme n.w.; pop. 25,000; univ.; hospitals; 11th cent. cathedral over shrine of Apostle St. James.

**Santiago de Cuba,** port on s.e. coast of Cuba; pop. 70,000; mining dist.; extensive export trade; founded by Spain (1514), early cap. of Cuba; stormed by U.S. (1898); **936;** naval battle, **3306.**

**San'to Domin'go** or **Dominican Republic,** the e. two-thirds of isl. of Haiti; 19,000 sq. mi.; pop. 955,000; **3125–6, 1560,** *map,* **2514–5;** attempted annexation to U.S., **1499;** coffee, **824;** under U.S. Bureau of Insular Affairs, **3599.**

**Santo Domingo,** cap. of republic of Santo Domingo, on s. coast at mouth of Ozama R.; pop. 27,000; **3126.**

**Santorin** (*sän-tō-rēn'*) (corruption of St. Irene). Volcanic isl. in Aegean Sea, southernmost of Cyclades; 27 sq. mi.; important remains of prehistoric Aegean civilization; anc. Théra, powerful commercial state.

**Santos** (*sän'tōs*), Brazil, port 200 mi. s.w. of Rio de Janeiro; pop. 90,000; good harbor; port for São Paulo; greatest coffee-shipping port in world, **495, 3286,** *picture,* **824.**

**Santos-Dumont** (*sän'tōs-dü-môn'*), **Alberto** (born 1873), Fr. aeronaut, b. Brazil; built first dirigible propelled by internal combustion engine, also first airplane to make public flight; **313,** *picture,* **57.**

**San Vicente** (*vē-sĕn'tā*). City of republic of Salvador 30 mi. e. of San Salvador; on Acahuapa R.; pop. 29,000; large commerce, various mfrs.; cap. of republic 1839–40.

**São Francisco** (*souñ frän-sēs'-kō*) **River,** chief r. in e. Brazil; rises n.w. of Rio de Janeiro, flows 1800 mi. n. and e. to Atlantic; *map,* **494.**

**São Luiz** (*lų-ēz'*), Brazil. Same as **Maranhão.**

**Saône** (*sōn*) **River,** in e. France, rises just w. of Vosges Mts., flows 300 mi. s. to Rhone; connected with Loire and Seine by canals; **1345,** *map,* **1351.**

**São Paulo** (*souñ pou'lō*), seaboard state of s. Brazil; 112,278 sq. mi.; pop. 4,824,000; cap. São Paulo; coffee industry, **822, 495.**

**São Paulo,** 2d city in Brazil, 210 mi. s.w. of Rio de Janeiro and 25 mi. from coast; pop. 505,000; industrial and trade center; greatest coffee market, **495.**

**São Paulo de Loanda** (*dā lō-än'dä*). *See in Index* **Loanda.**

**São Salvador,** Brazil. *See in Index* **Bahia.**

**São Thomé** (*tō-mā'*). *See in Index* **St. Thomas.**

**Sap,** in plants, **2825–6,** *picture,* **2823;** in trees, **3532,** *picture,* **3531.**

**Sapajou** (*săp'ä-jų*) or **Capuchin monkey,** *picture,* **2289.**

**Sapodil'la** or **naseberry,** a tropical tree; fruit, **1378;** chicle gum, **719.**

**Saponifica'tion,** the formation of soap, **3263, 3267.**

**Sapphi'ra.** *See in Index* **Ananias.**

**Sapphire** (*săf'īr*), a precious stone, **1409, 1410, 1142;** artificial, **1410;** in Burma, **541;** in Montana, **2310.**

**Sapphire cat,** *pictures,* **659.**

**Sappho** (*săf'ō*) (7th–6th cents. B.C.), Gk. poetess, b. isl. of Lesbos; called "flower of the Graces"; known today by few exquisite fragments of verse; legend says she flung herself from Leucadian rock for unrequited love; **1536;** anc. manuscript, *picture,* **1537;** painting by Alma-Tadema, *picture,* **1534.**

**Saprophytes** (*săp'rō-fītz*), plants which live on dead organic matter, **2823;** among fungi, **1382;** yeasts and fermentation, **2825, 3828.**

**Sap-sucker,** a woodpecker, **3781,** *picture,* **416.**

**Sapul'pa,** Okla., center of oil and farming region 15 mi. s.w. of Tulsa; pop. 11,634; oil refineries; r. r. shops, cotton gins, glass plants; **2576.**

**Sap-wood,** of trees, **3532.**

**Sar'acens,** name applied to Mohammedans in Middle Ages, **2278.** *See also in Index* **Arabs; Mohammedanism; Moors.**

**Saragossa** (*săr-ä-gŏs'ä*) or **Zaragoza,** Spain, r.r. and commercial center on Ebro R., 175 mi. n.e. of Madrid; pop. 125,000; taken by French after heroic resistance in Peninsular War (1808–09); **3300.**

**Sarah,** wife of Abraham, **3.**

**Sarajevo.** *See in Index* **Serajevo.**

**Saranac** (*săr'ä-năk*) **Lake,** N.Y., village in Adirondack Mts.; pop. 5174; sanitarium, **25.**

**Sarasate** (*sä-rä-sä'tā*), **Pablo de** (1844–1908). Span. violinist and composer; noted for lively dance music.

**Saratof** (*sä-rä-tŏf'*), Russia. Important city on Volga R., 450 mi. s.e. of Moscow; pop. 235,000; r.r. shops, mfrs.; exports grain; extensive river trade.

**Saratoga** (*săr-ä-tō'gä*), **battles of** (Sept. 19 and Oct. 7, 1777), **3126, 1409;** Arnold at, **219;** Burgoyne surrenders (Oct. 17), **3126.**

**Saratoga Springs,** N.Y., popular health resort 38 mi. n. of Albany; pop. 13,181; **3126.**

**Sarawak** (*sä-rä'wäk*), Brit. protectorate in Borneo; 42,000 sq. mi.; **468,** *map,* **1072.**

**Sarcophagus** (*sär-kŏf'ä-gŭs*), a stone coffin; Egyptian, *picture,* **1104;** Italian, *pictures,* **1204, 1205;** Roman, *picture,* **3156.**

**Sardanapalus** (*sär-dä-nä-pā'lŭs*). Gk. name of last great Assyrian king Assurbanipal; according to legend he burned himself, his wives, and treasures, to avoid falling into rebel power. *See also in Index* **Assurbanipal.**

**Sardines'** or **pilchards,** small food fish, **3126;** belong to herring family, **1645;** Brest fisheries, **502;** important to anc. Greece, **1518.**

**Sardin'ia,** Ital. isl. in Mediterranean w. of Italy; 9299 sq. mi.; pop. 880,000; **3126–7,** *maps,* **1196–7, 1836;** sheep, **3198.** For history of kingdom of Sardinia (Sardinia-Piedmont) *see in Index* **Piedmont.**

**Sardis** (*sär'dĭs*) or **Sardes,** cap. of anc. Lydia, Asia Minor; flourished under Croesus; destroyed by Timur (1402 A.D.); important recent excavations; **923, 2738.**

**Sardonyx** (*sär'dō-nĭks*), a variety of quartz, **1411, 2945;** August birthstone, **1409.**

**Sardou** (*sär-dų'*), **Victorien** (1831–1908), Fr. dramatist, dexterous and prolific; chief works, **1038.**

**Sargas'so Sea,** region in n. Atlantic, **3170.**

**Sargas'sum,** or gulf weed, **3170.**

**Sargent, John Singer** (born 1856), Amer. painter, b. Florence, Italy, **3127;** 'Frieze of the Prophets', *picture,* **2923.**

**Sar'gon I** (about 2750 B.C.), anc. Semitic king, founder of first great nation in w. Asia, **295.**

**Sargon II** (reigned 722–705 B.C.), king of Assyria, **298, 1669;** palace, **298,** *picture,* **295;** site of city, **2510.**

**Sarikol Mts.,** cent. Asia, **226.**

**Sark.** One of Channel Isls.; 3 mi. long; famous cliffs and caves.

**Sar'nia,** Ontario. Port on L. Huron and St. Clair R.; pop. 15,000; oil, salt, lumber, iron and steel products; natural gas.

**Sarong** (*sä'rŏng*), a Malay garment, **2130.**

**Saron'ic Gulf,** arm of Aegean Sea separating Peloponnesus from n. e. Greece, **886, 626,** *map,* **1518.**

**Sarpedon** (*sär-pē'dŏn*), Trojan War hero, **3543.**

**Sarsaparil'la, 3127.**

**Sar'to, Andrea del** (1486–1531), Florentine artist, great draftsman and colorist, **2630, 2997.**

**Sarto'rius muscle,** *picture,* **2373.**

**'Sar'tor Resar'tus',** essay by Carlyle, **645.**

**Sa'rum.** *See in Index* **Old Sarum.**

**Saskatch'ewan,** a prairie province of Canada, greatest wheat-growing dist. of Dominion; 251,700 sq. mi.; pop. 825,000; **3128–9,** *map,* **602–3;** cap. Regina, **2992;** public lands, **1960;** wheat-growing, **602, 3732.**

**Saskatchewan, University of.** At Saskatoon, Saskatchewan; co-ed., provincial control; founded 1907; arts and science, agriculture, law, engineering, accounting, pharmacy.

**Saskatchewan River,** Canada, a river formed by union of N. and S. Saskatchewan branches near Prince Albert, Saskatchewan; flows 240 mi. e. to L. Winnipeg; **3129,** *map,* **616;** at Edmonton, **1084;** timber resources on, **83.**

**Saskatoon'.** Second city of Saskatchewan; distributing point for grain and cattle; pop. 25,000; flour, cereals, foundry products, machinery; U. of Saskatchewan.

**Sas'safras,** a tree, **3129;** autumn coloration, **3537;** belongs to laurel family, **1970;** classified, **3533;** tea, **3451.**

**Sassafras Mountain,** highest point in South Carolina, **3291.**

**Sas'sanid dynasty,** last native dynasty of anc. Persia (226–637), **2738.**

**Sassari** (*säs'sä-rē*), Italy, province in Sardinia; also its cap. (pop. 45,000); **3127.**
**Sassoon', Siegfried Loraine** (born 1886), Eng. poet ('The Old Huntsman'; 'Collected War Poems'), **1168.**
**Satan.** *See in Index* **Devil.**
**Satellites** (*săt'ĕ-līts*), of planets, **2818.**
**Sat'in,** a glossy closely woven silk (or cotton and silk) fabric; introduced into Europe, **932.**
**Satinwood,** a tree yielding fine cabinet wood; in India, **1748;** in Ceylon, **684.**
**Satire** (*săt'ir*), a type of literary composition in which vice and folly are ridiculed; Dryden, **1043;** in Eng. literature, **1165;** in Latin literature (Horace and Juvenal), **1967;** Pope, **2879;** Rabelais, **2951;** Swift, **3406.**
**Sa'trap,** anc. Persian official, **2738.**
**Sat'suma ware,** a kind of earthenware made in Japan; named from the province of Satsuma in s.w. of Kyushu: **1874.**
**Satura'tion point,** in physics, **1000.**
**Sat'urday,** 7th day of week; meaning of name, **969.**
**Sat'urn,** in Rom. myth., god of agriculture, identified with Gk. Kronos, **3129, 1382, 3607;** gave name to Saturday, **969.**
**Saturn,** a planet, **2817, 242;** length of day, **2816;** orbit, speed, and size, *picture*, **2816;** rings, **2819, 2433, 1391,** *picture*, **243;** satellites, **2818.**
**Saturna'lia,** Rom. festival, **3129.**
**Satyrs** (*săt'ĕrz* or *sā'tĕrz*), in Gk. myth., **1012, 2648.**
**Sauerkraut, 553.**
**Sau'gus,** Mass. Town 8 mi. n.e. of Boston on Saugus R. and Massachusetts Bay; pop. 10,874; woolen goods, boots and shoes, spices, bricks.
**Sauks** or **Sacs,** Indian tribe of Algonquian group, driven from Ottawa R. region to Wisconsin; joined by Foxes; lived along Mississippi and Rock R. region; **1765, 1772.**
**Saul** (*sal*), first king of Israel (1030 B.C.), **1890;** and David, **967.**
**Saul of Tarsus, 2698.**
**Sault Sainte Marie** (*sō sān mä-rē'*), the rapids of St. Marys River or Strait, between lakes Superior and Huron, **3129–30.**
**Sault Sainte Marie,** Mich., port and r.r. center on Sault Ste. Marie ship canal; pop. 12,096; extensive traffic; carbide, leather, forest products; **3130.**
**Sault Sainte Marie,** Ontario, port, mfg. city, and summer resort on Sault Ste. Marie ship canal; pop. 20,000; paper, lumber, steel and iron products; **3130.**
**Sault Sainte Marie ("Soo") Canals, 3129–30, 1513;** Clay opposes, **2223.**
**Sau'ria,** subclass of reptiles, **2997, 2035–6, 2038, 3261.**
**Sausage balloons, 316, 320,** *picture*, **317.**
**Savagery,** the most primitive state of society, **771.**
**Savaii** (*sä-vī'ē*) or **Sawaii,** largest of Samoan Isls.; 660 sq. mi.; legendary home of Polynesian race, **2621.**
**Savan'nah,** Ga., important Atlantic seaport and 2d largest city of state; pop. 83,252; **3130, 1432, 1434;** in Rev. War, **2933, 3004, 3130;** in Civil War, **3206, 3130.**
**Savannah,** r. forming boundary between Georgia and South Carolina; rises in Blue Ridge Mts., flows s.e. 450 mi. to Atlantic; navigable to Augusta; *map*, **1432;** Oglethorpe founds colony on, **1434.**
**'Savannah',** steamship, **3210.**
**Savannas,** defined, **2790;** African, **34.**
**Save** (*säv*) **River,** one of chief tributaries of the Danube; rises in Carniola and flows 500 mi. across Jugo-Slavia; scene of fierce fighting in World War; **376, 962,** *map*, **308.**
**Savery, Thomas** (1650?–1715), Eng. inventor; steam pumping engine, **3348.**
**Savings banks, 327, 2725.**
**Savona** (*sä-vō'nä*), city on Italian Riviera, 25 mi. s.w. of Genoa; pop. 50,000; good harbor; important iron industries; large potteries; Apennines, **154.**
**Savonarola** (*sä-vō-nä-rō'lä*), **Girolamo** (1452–98), Florentine priest and reformer, **3130–1, 1294.**
**Sa'vory,** an herb, **3319.**
**Savoy** (*sȧ-voy'*), former duchy lying between Italy and France in w. Alps; checkered history under House of Savoy after 11th cent.; ceded to France, **3638, 1837;** and Geneva, **1412;** obtains Sardinia, **3127.**
**Savoy, House of.** The oldest reigning family of Europe, a branch of which now occupies the Italian throne; founded by Humbert the Whitehanded in first half of 11th century and ruled over Savoy and Piedmont for 9 centuries.
**Savoy cabbage,** a wrinkled-leaf variety, **553.**
**Saw,** machine types, **2082, 3516;** band-saw, *picture*, **2080.**
**Sawfish,** a long-snouted, ray-like fish, **3131,** *picture*, **1274;** distinguished from swordfish, **3423.**
**Sawmill, 2082,** *pictures*, **2080–1.**
**Sawyer beetle,** one of the longhorn family of beetles, which usually live in wood; mandibles, *picture*, **1782.**
**Sax, Antoine Joseph** (known as Adolph) (1814–94), Belgian maker of musical instruments, **1681.**
**Saxe** (*săks*), **John G.** (1816–87). Amer. poet and humorist, very popular in middle 80's; b. Highgate, Vt. ('The Proud Miss McBride'; 'Rhyme of the Rail').
**Saxe** (*säks*), **Maurice** (1696–1750). Illegitimate son of Augustus the Strong of Saxony and Poland; marshal of France, one of greatest generals of his age; victor of Fontenoy.
**Saxe-Altenburg** (*săks-ăl'tĕn-bûrg̈*). Former Ger. duchy, since 1919 part of Thuringia; 511 sq. mi.; pop. 212,000.
**Saxe-Coburg-Gotha** (*kō'bûrg̈-gō'tȧ*). Former Ger. duchy; 763 sq. mi.; Coburg was added (1919) to Bavaria, but remainder of duchy is part of Thuringia; had pop. about 350,000.
**Saxe-Meiningen** (*mī'nĭng-ĕn*). Former Ger. duchy, since 1919 part of Thuringia; 953 sq. mi.; pop. 192,000; crescent-shaped strip on n. boundary of Bavaria.
**Saxe-Weimar** (*vī'mär*). Former Ger. grand duchy, since 1919 part of Thuringia; 1394 sq. mi.; pop. about 270,000; industrially important section (pottery, textiles); chief cities Weimar and Eisenach; dukes of Saxe-Weimar famous as patrons of art and literature, and Weimar became home of Goethe, Schiller, Herder, and other men of letters.
**Sax'horn,** musical instrument, **1681.**
**Sax'ifrage,** a plant related to the roses, **3131.**
**Sax'ons,** a Teutonic people of n. Germany appearing in history in 2d. cent., **3132, 1194, 1447;** Charlemagne conquers, **689, 690;** costume, *pictures*, **1151, 3222;** rulers in England, *table*, **1152.** *See also in Index* **Anglo-Saxons.**
**Saxony,** republic (former kingdom) of s. Germany; 5789 sq. mi.; pop. 4,671,000; **3131–2;** cap. Dresden, **1041;** bismuth, **428;** industrial dist., **1444;** Leipzig, **1985;** potash deposits, **2898, 2900;** Saxon emperors, **1447;** in Seven Years' War, **3180;** Thirty Years' War, **3489.**
**Saxony wool, 3200.**
**Sax'ophone,** a musical instrument, **1681,** *picture*, **2382.**
**Say'brook,** Conn. Small town on Connecticut R. near mouth; settled by English 1635; united with Connecticut 1644; early home of Yale Univ.
**Sayes Court,** John Evelyn's estate, *picture*, **2746.**
**"Say not the struggle nought availeth," 1222.**
**Scaevola** (*sēv'ō-lȧ*), **Gaius Mucius.** Legendary Rom. hero; captured by enemy and threatened with death by torture unless he would betray comrades, thrust right hand into fire and held it until consumed.
**Sca Fell,** mt. of Cumberland, England, **1160.**
**Scalding,** relief for, **1269.**
**Scale, computing, 196,** *pictures*, **199, 571, 572.**
**Scale insects,** small bugs parasitic on trees and fruit, **3132–3;** cochineal, **817;** killed by sprays, **3330–1;** lac-insect, **1954.**
**Scale-leaves,** in bulbs, **532.**
**Scales,** a sign of the zodiac, **3840.**
**Scaliger** (*skăl'ĭ-jẽr*), **Joseph Justus** (1540–1609). Fr. scholar, called "father of chronological science"; first showed that chronologies of different nations must be compared; son of the philosopher J. C. Scaliger (1484–1558).
**Scal'lop,** a bivalve mollusk, **3133–4, 2280,** *picture*, **3203.**
**Scan'derbeg (George Castriota)** (1403–67), national hero of Albania, **79.**
**Scandina'via,** collective name applied to Denmark, Sweden, and Norway, **3134;** story, 'The Apples of Iduna', **3135–6.** *See also in Index* **Denmark; Norway; Sweden.**
**Scandinavian Alliance, 879.**
**Scandinavian languages and literature, 3134, 4003;** drama, **1038;** Eng. words from, **1162;** folk-songs, **1318;** Icelandic, **1724;** novel, **2541;** surnames, **2389.**
**Scandinavian myths, 3984;** reflect racial character, **2385.**
**Scandinavian Peninsula, 2529, 1188, 1191, 3402,** *maps*, **1196–7, 2531.**
**Scan'dium,** a rare metallic element, **4042.**
**Scapa** (*skä'pȧ*) **Flow,** channel in Orkney Isls., chief Brit. naval base in World War, **2601, 2424.**
**Scar'ab,** a beetle, **369, 371,** *picture*, **367;** June bug a type, **1902;** Egypt. seals, **1410.**
**Scarborough** (*skär'bŏr-ō*), England. Popular seaside resort in Yorkshire; pop. 37,000; fisheries; bombarded by Germans 1914.
**Scarf skin,** the epidermis, **3245.**
**Scarlet, Will.** One of Robin Hood's followers.
**Scarlet flamingo,** *picture*, **414.**
**Scarlet holocanthus,** a fish, *picture*, **1271.**
**'Scarlet Letter',** novel by Hawthorne, **1607, 1609.**
**Scarlet runner,** an ornamental bean-plant, **349.**
**Scarlet tanager,** a bird, **3432,** *picture*, **420;** molting, **410.**
**Scarpe,** small r. in n.e. France, **220.**
**Scarron** (*skä-rôṅ'*), **Paul** (1610–60). Fr. poet and dramatist, **2129.**
**Scar-tattooing, 3440.**
**Scavenger's daughter,** instrument of torture, *picture*, **2919.**
**Schaffhausen** (*shäf-hou'zĕn*), Switzerland, cap. of canton of same name, 24 mi. n. of Zurich; pop. 16,000; celebrated falls of Rhine, **3005.**
**Scharn'horst, Gerhard Johann David von** (1755–1813). Prussian general, one of founders of Prussian military system (1809–13); fatally wounded at battle of Lützen.
**Schaumburg - Lippe** (*shoum'bu̇rĸ-lĭp'ē*). Republic in n. Germany, formerly principality; 131 sq. mi.; pop. 47,000.

**Schee'lite,** a tungsten ore, **3548.**

**Scheer, Reinhold** (born 1863). Ger. admiral; commander-in-chief of Ger. battle fleet in latter part of World War.

**Schef'fel, Joseph Victor von** (1826–86). Ger. poet and novelist ('Der Trompeter von Säckingen'; 'Ekkehard').

**Scheherazade** (*shĕ-hä-rä-zä'dĕ*), in the 'Arabian Nights', wife of the sultan and narrator of the tales, **168.**

**Scheidemann** (*shī'dē-män*), **Philipp** (born 1865). Ger. Socialist leader, first chancellor of Ger. republic (1919).

**Scheldt** (*skĕlt*) **River,** an important navigable r. of Belgium rising in France and flowing 250 mi. to North Sea, **3136,** *map,* **373;** Antwerp commerce, **152;** delta, **2438.**

**Schelling** (*shĕl'ing*), **Friedrich Wilhelm Joseph von** (1775–1854), Ger. philosopher, **1438.**

**Schenectady** (*skĕ-nĕk'tà-dĭ*), N.Y., industrial city on Mohawk R. and New York Barge Canal; pop. 88,723; **3136.**

**Scheria** (*skē'rĭ-à*), **Island of,** in 'Odyssey', home of Phaeacians; probably Corfu; **2563.**

**Scherzo** (*skĕr'tsō*), in music, **2379.**

**Scheveningen** (*sĸā'vĕn-ĭng-ĕn*), a fishing port and watering place of the Netherlands on North Sea, **2441, 1558;** costume, *picture,* **2439.**

**Schiedam** (*sĸē-dăm'*), Netherlands. River port near mouth of Meuse R. 4 mi. w. of Rotterdam; pop. 39,000; numerous canals; distilleries, trade in gin, grain.

**Schiller** (*shĭl'ēr*), **Ferdinand Canning Scott** (born 1864). Eng. philosopher, leading Eng. exponent of pragmatism ('Riddles of the Sphinx').

**Schiller, Johann Christoph Friedrich** (1759–1805), Ger. poet and dramatist, **3137,** *pieture,* **1435;** friendship with Goethe, **1478;** in Weimar, **3715–6.**

**Schism.** *See in Index* **Great Schism.**

**Schizomycetes** (*skĭz-ō-mī-sē'tēz*), plant sub-phylum, including bacteria and blue-green algae, **3938.**

**Schlegel** (*shlā'gĕl*), **August Wilhelm von** (1767–1845). Ger. critic, poet, and translator.

**Schlegel, Karl Wilhelm Friedrich von** (1772–1829). Ger. critic, scholar, and poet, "real founder of romantic school"; brother of A.W. von Schlegel.

**Schleiermacher** (*shlī'ĕr-mä-ĸĕr*), **Friedrich Ernst Daniel** (1768–1834). Ger. theologian and philosopher.

**Schleswig-Holstein** (*shlāz'vĭĸ-hōl'shtīn*), Prussian province in Danish peninsula; former Danish duchies of Schleswig, Holstein, and Lauenburg; forcibly annexed by Prussia (1866); n. Schleswig returned to Denmark following plebiscite after World War; 5805 sq. mi.; pop. 1,462,000; **994, 997, 428,** *maps,* **997, 1440.**

**Schley** (*slī*), **Winfield Scott** (1839–1911), Amer. rear-admiral, rescued Greely, 1884; in battle of Santiago (1898), **3306.**

**Schleyer, Johann Martin** (1831–1899), Ger. priest, inventor of Volapük, **1177.**

**Schliemann** (*shlē'män*), **Heinrich** (1822–90), Ger.-Amer. archeologist, **3137–8, 3543.**

**Schmalkalden** (*shmäl-käl'dĕn*). Town of Hesse-Nassau, Prussia; iron and steel mfg. center; here Protestant princes of Germany formed Schmalkaldic League 1530 to resist efforts of Charles V to stamp out Protestantism.

**Schmalkal'dic War** (1546–47), **2988.**

**Schnitzler** (*shnĭts'lēr*), **Arthur** (born 1862). Austrian dramatist and novelist; light deft psychological comedy and satire ('Anatol').

**Schofield** (*skō'fēld*), **John McAllister** (1831–1906). Amer. Civil War general, b. Chautauqua County, N.Y.; commanded Army of the Ohio 1864; commanded 23d corps in Sherman's Georgia Campaign; superintendent U.S. Military Academy 1876–82; commanding general 1888–95 of U.S. Army.

**Scholarships,** in colleges, **830–1;** Rhodes, **3011–2.**

**Scholas'ticism,** medieval system of philosophy, **2773.**

**Schönbrunn** (*shûn'brŭn*). Imperial castle near Vienna, Austria; treaties signed here between Napoleon and Prussia (1805), and Austria (1809) deprived those two countries of much territory.

**Schöngauer** (*shûn'gou-ĕr*), **Martin** (1445?–91). Ger. painter and engraver, who attained, especially in his engravings, a firmness in modeling, delicacy in shading, and picturesqueness in landscape background exceeding any previous Ger. artist.

**School, 3138–42, 1084, 1086;** commercial and industrial, **3140–1;** continuation, **3141, 1086;** correspondence, **3140;** dental clinics, **998;** fire protection, **1262;** source of funds, **1086, 3441;** medical care, **1614;** vacation, **3140;** ventilation, **1624.** *See also in Index* **Education.**

**Schoolcraft, Henry Rowe** (1793–1864), Amer. ethnologist, b. Guilderland, N.Y. ('Indian Tribes of the U.S.', 6 large volumes published by order of Congress); Indian agent in L. Superior region for nearly 20 years; Longfellow's 'Hiawatha', **2057;** discovers Mississippi's source, **2265.**

**'School for Scandal, The',** one of R. B. Sheridan's popular comedies, first produced in 1777; the action deals chiefly with the scandalmongers who frequented Lady Sncerwell's house; **1036.**

**School gardens, 3142–3.** *See also in Index* **Gardens and gardening.**

**Schoolmen,** in Middle Ages, learned doctors who taught Scholasticism, **2773.**

**Schooner,** a sailing vessel, **3203, 3209, 3210.**

**Schopenhauer** (*shō'pĕn-hou-ĕr*), **Arthur** (1788–1860), Ger. philosopher, who taught the pessimistic doctrine that the only ultimate "reality is one universal will"; but will or impulse is not rational; therefore man's permanent redemption can be obtained only by moral unselfishness and resignation; **1438,** *picture,* **1436.**

**Schouler, James** (born 1839). Amer. lawyer and historian, b. Arlington, Mass. ('History of the United States under the Constitution', in 7 volumes; 'Life of Thomas Jefferson'; 'The Law of Domestic Relations').

**Schreiner** (*shrī'nēr*), **Olive** (1862?–1920). S. African author; used pen name "Ralph Iron" ('Story of an African Farm', a spiritual autobiography, showing a development from rigid Calvinism to hopeless atheism; 'Woman and Labor', an expression of her strong feminist views).

**Schreiner, William Philip** (1857–1919). S. African lawyer and statesman, brother of Olive; for many years foremost lawyer in Cape Colony; prime minister 1898–99; after 1914 High Commissioner for Union of S. Africa in London.

**Schroeder, Major R. W.,** Amer. aviator, **62.**

**Schubert** (*shų'bērt*), **Franz Peter** (1797–1828), Ger. composer, world's greatest song writer, **3143, 2380.**

**Schumann** (*shų'män*), **Clara** (1819–96), Ger. musician, one of the great concert pianists of her time; after her husband's death she wrote numerous charming songs and some instrumental music largely in her husband's style; **3143–4.**

**Schumann, Robert** (1810–56), Ger. composer, **3143–4;** friends, **2026, 2198.**

**Schumann-Heink** (*shū'män-hĭnk*), **Ernestine** (born 1861). Amer. singer, b. Prague, Bohemia; considered greatest lyric and operatic contralto of her time; star at 17; since has sung in opera and concert in leading cities of world.

**Schurz** (*shŭrts*), **Carl** (1829–1906), Amer. publicist, and Ger. revolutionist of 1848–49; b. Germany; Civil War general; ardent Civil Service reformer; as Hayes' sec. of interior (1877–81) introduced competitive examination for civil service positions; **1448, 3737.**

**Schuyler** (*skī'lēr*), **Philip John** (1733–1804), Amer. Rev. patriot and general, member of Continental Congress, later Federalist leader and U.S. senator from New York; always conspicuous for patriotism and devotion to duty; at battle of Saratoga, **1409.**

**Schuylkill** (*skų'kĭl*), r. of s.e. Pensylvania flows into Delaware after 100 mi. course, **2983, 2760,** *map,* **2718.**

**Schwab** (*shwäb*), **Charles M.** (born 1862). Amer. capitalist; b. Williamsburg, Pa.; largely responsible for Carnegie's participation in the "steel trust," and first pres. (1901–03) U.S. Steel Corporation; later headed Bethlehem Steel Corporation, steel trust's chief rival; during World War director-general of shipbuilding in U.S. Shipping Board Emergency Fleet Corporation.

**Schwann** (*shvän*), **Theodor** (1810–82), Ger. physiologist; assistant of Johannes Müller; discovered pepsin, investigated nerve structure; founded histology, **3841.**

**Schwartz** (*shvärts*), **Berthold** (14th cent.), Ger. inventor, **1552.**

**Schwartz, J. M. W.,** Dutch novelist. *See in Index* **Maarten Maartens.**

**Schwarzburg** (*shvärts'bŭrg*). Name of two former principalities in Germany, now part of Thuringia: Schwarzburg-Rudolstadt (363 sq. mi.; pop. 100,000); Schwarzburg-Sondershausen (333 sq. mi.; pop. 94,000).

**Schwerin** (*shvā-rēn'*), Germany. Cap. of Mecklinburg-Schwerin, on L. Schwerin, 60 mi. e. of Hamburg; pop. 44,000; handsome ducal palace; makes pianos, furniture, dyes.

**Schwyz** (*shvēts*), Swiss canton; 351 sq. mi.; in medieval times a free community; gave name to Switzerland; in Swiss confederacy, **3464, 3414.**

**Sciatic** (*sī-ăt'ĭk*) **nerves.** Two mixed nerves, rising in nerve plexus in pelvis; great sciatic largest nerve in the body, passing down back of thigh, branching to muscles and skin of leg and foot; small sciatic branches to muscles and skin of upper leg and hip.

**Science** (*sī'ĕns*), **3144–5;** anc. Hindu, **1756;** Archimedes, **174–5;** Aristotle and anc. science, **196;** Roger Bacon, **301;** Lord Bacon's inductive method, **301, 1164;** "conservation of energy" doctrine, **1148–9;** Copernican theory, **880–1;** Darwin's doctrine of evolution, **963–4;** effect on world's population, **2880;** future possibilities, **2586–7;** Galileo's contributions, **1391–2;** Huxley champions evolution doctrine, **1705–6;** Kepler's work, **1920–1;** Linné, **2018;** Mohammedan contributions, **2278;** Newton's contributions and influence, **2476–8, 1165;** opposition to science, **1796–7;** philosophy distinguished, **2772;** Ptolemy, **2931–2;** "seven wonders," **3177–9;** Tyndall popularizes physics, **3572.**

The principal sciences treated separately in these volumes are: anatomy, **121**; anthropology, **149** (man, **2133–4**; races of mankind, **2956–7**; cave-dwellers, **666–70**); astronomy, **239–47**; biology, **393–9**; botany, **473–5, 2820–31**; chemistry, **710–6**; economics, **1076–8**; engineering, **1149–50**; geography, **1413–6**; geology, **1417–22**; mathematics, **2174**; medicine and surgery, **2192–3**; meteorology (weather, **3707–9**; climate, **794–5**); paleontology (fossils, **1333–6**; prehistoric animals, **132–8**); philology, **2770–2**; physics, **2786–7**; physiography, **2787–92**; physiology, **2792–7**; psychology, **2930–1**; sociology, **3270**; zoölogy, **3841, 126–31**. For detailed references and subdivisions *see in Index* the titles above by name.

**'Science and Health'**, textbook of Christian Science, **1080**.

**Scilly** (*sĭl'i*) **Islands.** A group of 140 small granite isls. off Cornwall, England; many shipwrecks.

**Scim'itar,** a sword, **3422**.

**Scio** (*sī'ō*). *See in Index* **Chios.**

**Scion** (*sī'ŏn*), in fruit grafting, **1377**.

**Scioto** (*sī-ō'tō*) **River,** tributary of Ohio R., 200 mi. long, *map*, **2568**; at Columbus, **849**.

**Scipio** (*sĭp'i-ō*) **Africanus, the Elder** (237–183 B.C.), one of greatest Rom. generals; defeated Hannibal at Zama 202 B.C.; father of Cornelia, mother of the Gracchi; invasion of Africa, **1575**; bust, *picture*, **3043**.

**Scipio Africanus, the Younger** (185–129 B.C.). Rom. general, adopted grandson of the elder Scipio Africanus; captured and destroyed Carthage (146 B.C.).

**Scissorbill.** Same as **Skimmer.**

**Scitaminales** (*sĭt-ă-mĭn-ā'lēz*), plant order containing banana, canna, and ginger families, **3940**.

**Sciurus** (*sī-yu̇'rŭs*), the squirrel genus, **3334**.

**Sclerotic** (*sklĕ-rŏt'ĭk*), outer coat of the eye, **1213**, *picture*, **1214**.

**Scombridae** (*skŏm'brĭ-dē*) or **mackerel family,** family of spiny-finned fish with spindle-shaped bodies; includes albacore, **3553**, bonito, **3558**. mackerel, **2102**, tunny or tuna fish, **3552–3**.

**Scone** (*skon*), Scotland, parish n. of Perth; historic abbey and palace; "stone of Scone," **3719**.

**Scooter,** a form of ice craft, **3756**.

**Sco'pas,** Gk. sculptor of 4th cent. B.C.; said to have sculptured part of Mausoleum of Halicarnassus; work characterized, **1532**.

**Scopolamin** (*skō-pō-lăm'ĭn*) or **hyosin,** an alkaloid found in henbane; used as anesthe'ic, **125**.

**Sco'ria** or **scoria'ceous lava, 1972.**

**Scorifica'tion,** in assaying, **236**.

**Scor'pio** or **Scorpion,** a sign of the zodiac, **3840**.

**Scorpion,** an arachnid, **3145**.

**Scorpion, water,** a water-bug, **3698**.

**Scorpion fly** or **panorpa,** an insect, **1788**; foot, *picture*, **1784**.

**Scorpion shell** or **spider shell,** a gastropod of the Indian and Pacific oceans, *picture*, **3201**.

**Scotch blackface sheep,** *picture*, **3199**.

**Scotch boiler, 3349.**

**Scotch collie, 1019–20.**

**Scotch mile, 3715.**

**Scotch pine, 2808.**

**Scotch terrier, 1023,** *picture*, **1021**.

**Scotch thistle, 3489, 3490.**

**Sco'ters,** a genus of sea ducks noted for diving powers; commonly called "sea coots"; seasonal migration, *picture-map*, **2231**.

**Scotland,** country occupying n. part of isl. of Great Britain; 29,797 sq. mi.; pop. 5,000,000; cap. Edinburgh; **3146–9**, *maps*, **1152–3, 1159, 1196–7**; education, **3149, 832**; games and sports, **940, 1486–7**; in Ice Age, **1720**; literature, **3149, 1164, 1166, 1167**; national song, **2405**; New Year's festival, **2479**; religion, **1941**; thistle emblem, **3489**.

*Geography and industries:* agriculture, **3146, 2549**; cities and mfrs., **3146–7, 2, 1080, 1470**; fisheries, **1285, 2**; heather, **1621**; Hebrides Isls., **1625**; Orkney Isls., **2601**; people, **3147, 3149, 674, 1224**; Shetland Isls., **3206**; sand dunes, **3121–2**.

*History,* **3147–9**; early civilization (Iona), **1625**; struggle for Edinburgh, **1082**; Northmen invade, **3489, 2601, 1625, 3206**; Wallace leads rebellion, **3667**; Bruce secures independence, **518**; Shetland Isls. acquired, **3206**; Reformation, **3148, 1941, 2988**; reign of Mary Stuart, **2158**; crown united with England's, **3372, 1860**; in Eng. Civil War, **3148–9, 693, 924–5**; Charles II, **694**; union with England, **3149, 2689**; Jacobite uprisings (1715 and 1745), **2914–5**.

**Scotland Yard,** London, **2054**.

**'Scots Wha Hae wi' Wallace Bled', 2405, 542.**

**Scott, Cyril** (born 1879). Eng. musical composer, pianist, and author of modernist school; compositions for violin and piano, songs ('Nativity Hymn').

**Scott, Duncan Campbell** (born 1862). Canadian man of letters ('Lundy's Lane and Other Poems'; life of J. G. Simcoe).

**Scott, Frederick George** (born 1861). Canadian poet, chaplain in World War, canon of Quebec cathedral; ('The Hymn of Empire'; 'My Lattice and Other Poems').

**Scott, Sir George Gilbert** (1811–78), Eng. architect; responsible for much of damage done to Eng. cathedrals and abbey churches during mid-Victorian fever of "restorations"; Albert Memorial, *picture*, **2050**.

**Scott, Hugh Lenox** (born 1853). Amer. general, b. Danville, Ky.; graduated West Point 1876; for 20 years campaigned against Indians, and other services in west; served in Cuba, Philippines, and on Mex. border; chief of staff U.S. Army 1914–17; U.S. mission to Russia 1917.

**Scott, Sir Percy** (born 1853), Brit. naval officer, retired 1913; invented night signaling apparatus and appliances for heavy gun shooting; **3243**.

**Scott, Robert Falcon** (1868–1912), polar explorer, **3149–50, 2863**; route, *picture-map*, **144**.

**Scott, Sir Walter** (1771–1832), Scotch novelist and poet, **3150–3, 2540**; Edinburgh monument, **1082**; and illuminating gas, **1797**; influenced by Goethe, **1478**; Rob Roy, **3033**; story, 'Tournament of Ashby', **3152–3**; 'The Talisman', **3112**.

**Scott, Walter** (born 1867). Canadian journalist and statesman, for nearly a generation probably the foremost Liberal in the Canadian Northwest; first premier of Saskatchewan (1905–16).

**Scott, General Winfield** (1786–1866), Amer. soldier, **3153**; suppresses Creeks, **1772**; in Mex. War, **2208, 3444**; defeated for president, **2802**.

**Scotti, Antonio** (born 1866). Ital. singer, whose fine bass voice and talent as an actor carried him to the forefront of operatic stars (Amonasro in 'Aïda'; Don Giovanni; Baron Scarpia in 'La Tosca').

**Scotus, John Duns.** *See in Index* **Duns Scotus.**

**Scotus Erigena.** *See in Index* **Erigena.**

**"Scourge of God," 763.**

**Scouts.** *See in Index* **Boy Scouts; Girl Scouts.**

**Scran'ton, Colonel George W.** (1811–81), Amer. manufacturer, one of organizers and first pres. Delaware, Lackawanna & Western Ry; Scranton, Pa., named for him, **3153**.

**Scranton,** Pa., 3d city of state; coal-mining and mfg. city on Lackawanna R.; pop. 137,783; **3153**.

**"Scrap of paper," 3790.**

**Screech owl, 2607,** *pictures*, **2607, 2411, 415, 411.**

**Screw,** a fastening; manufacture, **3514, 2388**.

**Screw,** in mechanics, **2188, 2189,** *picture*, **2190**; used in micrometer, **2227**.

**Screw, Archimedes',** a water-raising device, **175,** *picture*, **3696**.

**Screw propeller,** of ships, **3212–4**; applied to airplane, **55**; invention by Ericsson, **1174**.

**Screw shell,** *picture*, **3202**.

**Scriabine** (*skryä'bĕn*), **Alexander** (1872–1915). Rus. composer and pianist, in his youth a concert virtuoso, later one of the most extreme innovators in composition; in his last work, 'Prometheus', he attempts to prove relationship between music and color by using a "color-keyboard."

**Scribe** (*skrēb*), **Augustin Eugène** (1791–1861). Prolific Fr. dramatist, wrote some 400 plays noteworthy for sparkling dialogue and mastery of stage technique ('Adrienne Lecouvreur' his best); wrote libretti for operas by Auber and Meyerbeer.

**Scripto'rium,** room in medieval monastery, **456**.

**Scroll,** form of anc. book, *pictures*, **456, 389, 1992**.

**Scroll of the Law,** *picture*, **1889**.

**Scroo'by,** England, village in Nottingham, 20 mi. e. of Sheffield; Eng. home of John Robinson, Brewster, and other Pilgrims, **2175**.

**Scrooge, Old,** old man in Dickens' 'Christmas Carol', **760–2**.

**Scudéry** (*skü-dā-rē'*), **Madeleine de** (1607–1701). Fr. novelist, one of the leaders of Mme. de Rambouillet's brilliant salon; 'Grand Cyrus', a romance in 10 volumes, paints Fr. contemporary aristocracy, under a classic disguise.

**Scull,** a racing boat, **444**.

**Sculpins.** Grotesquely shaped fish with warted bodies, long spiny fins, and huge mouths; family *Cottidae:* most of them inhabit rocky coast in n. regions and prey voraciously on small sea animals.

**Sculpture, 3154–64,** *Study Outline*, **4006**; Aegean, **3156, 28**; American, **3164**; Babylonian and Assyrian, **3155–6, 298,** *pictures*, **296**; cave-dwellers, **668**; classic revival (18th cent.), **3158**; Egyptian, **3155, 1100, 1104,** *pictures*, **1103–6**; Greek and Roman, **1529–33, 3156, 11–12**; Hindu, **1707**; Hittites, **1669**; in ivory, **1854,** *picture*, **1873**; masterpieces, *pictures*, **3159–63**; Renaissance, **3156–8, 2996–7**; modern, **3164**. *See also in Index* names of famous sculptors.

**Scup'pernong grape, 1501.**

**Scur'vy,** disease in which bloody spots appear under skin, gums bleed, and sufferer is prostrated by general weakness; cause and prevention, **3651–2**.

**Scu'tage,** in feudalism, **1633**.

**Scutari** (*skų'tä-rē*) or **Skutari.** Chief town of Albania, on L. Scutari; pop. 32,000; fell to Montenegrins after siege in Balkan Wars; taken by Austrians in World War.

**Scutari,** Turkey. Town opposite Constantinople on e. shore of Bosporus; pop. 106,000; barracks of Selim III; hospital used by Florence Nightingale; famous cemetery.

**Scute** (*skūt*), a shield-like plate; on snakes, **3261**.

**Scylla** (*sĭl'ä*), in Gk. myth., a sea-monster, **2563, 3230**.

**Scyros** (*sī'rŏs*), small rocky isl. in Aegean off coast of Thessaly, connected in legend with Theseus and Achilles, **3487, 1520**.

**Scythia** (*sĭth'ĭ-ȧ*), name applied by Greeks to steppes n. of Black Sea inhabited by a nomadic people who disappear from history about 2d cent. B.C.; Romans gave name to little known region of n. Asia; burial mounds, **922.**
**Sea-anemone, 3164.**
**Sea-bear,** a seal-like mammal from which seal fur is obtained, **3167–8.**
**Sea cow** or **manatee, 2134;** evolutionary position, **128.**
**Sea-cucumber** or **holothurian,** animal related to starfish, **3165.**
**"Sea-devil"** or **skate.** *See in Index* **Rays.**
**Sea-dragon, 3165.**
**Sea-ducks, 1044, 1045–6.**
**Sea-elephant, 3168–9,** *pictures,* **2864, 3167.**
**Sea-fan** or **fan coral, 884, 3944,** *picture,* **885.**
**Sea Gate,** N.Y., summer resort, **857.**
**Sea-horse, 3165,** color plate facing **2553.**
**Sea-island cotton, 3291, 904, 906, 1431.**
**Sea Islands,** S.C., group of low sandy or marshy isls. between Charleston and Savannah, **3291.**
**Seal, 3166–9;** Bering Sea fisheries, **74, 1593, 3168;** evolutionary position, **128;** fossil, **1336;** fur, **1390;** fur imitated, **1389, 2385;** how Eskimos kill, **1177,** *pictures,* **1176.**
**Sea lettuce,** *picture,* **3170.**
**Sea-level,** the level of the oceans taken at mean tide; changes in, during geologic time, **1420.**
**Sealine fur, 1390.**
**Sea-lion, 3168,** *picture,* **3167.**
**Seals,** engraved gems, **1410.**
**Seamen's Act** (1915), U.S., **3219–20.**
**Sea moss.** Name sometimes given to Irish moss and to certain moss-like animals. *See in Index* **Bryozoa.**
**Seamrog,** Gaelic name for shamrock, **3195.**
**Seance** (*sā-äns'*), **3327.**
**Sea of Japan, battle of,** also called Tsushima, principal naval encounter of Russo-Japanese War, off isl. of Tsushima in Korea Strait (1905); **3098.**
**Sea-ooze, 396.**
**Sea-otter, 2605.**
**Seaplanes, 60, 63, 2428,** *pictures,* **57, 3796.**
**"Sea-purse,"** shark egg-cases, **3197.**
**Searchlights, 1123;** in signaling, **3233.**
**Searles Lake,** in s. California, potash deposits, **2900.**
**Sea-serpent, 3169;** oar-fish, **1276.**
**Sea-snakes, 3259, 2274.**
**Seasons,** cause of, **1619, 3285,** *picture,* **1063;** equinox and solstice, **1173.**
**Sea swallow.** Same as **Tern.**
**"Seat Perilous,"** in Arthurian legend, **3069.**
**Seat'tle,** largest city of Washington, seaport and mfg. city on Puget Sound; pop. 320,000; **3169–70, 3688, 3690;** plan of civic center, *picture,* **769;** U. of Washington, *picture,* **3689.**
**Sea urchin, 3170, 3345;** an echinoderm, **3165;** evolutionary position, **128.**
**Seaweed, 3170–1;** in coral isls., **886;** evolution, **91–2, 3700;** gelatin made from, **1409;** iodine, **1802;** potassium, **2900,** *picture,* **2899.**
**Seb** or **Keb,** in Egypt. myth., father of the gods, **2602.**
**Seba'ceous glands, 3246.**
**Sebas'tian** (1554–78), king of Portugal (succeeded 1557). Religious fanatic; killed in crusade against Moors; superstitious Portuguese awaited his return down to present cent.; several impostors have assumed his name.
**Sebastian, Saint** (d. 288 A.D.), Rom. soldier and Christian martyr; patron against the plague; shot by archers but recovered and later beaten to death; **2156.**
**Sebastiano del Piombo** (*sā-bȧs-tyä'nō dĕl pyōm'bō*) (1485–1547). Ital. painter, b. Venice, friend of Michelangelo, who outlined some pictures for Sebastiano to fill with color; some portraits attributed to Raphael now recognized as Sebastiano's.
**Sebastopol** (*sē-bȧs'tō-pōl*) or **Sevastopol,** famous Rus. naval station on Black Sea in s.w. Crimea; pop. 77,000; bombarded by Turks in World War; **434;** in Crimean War, **922.**
**Seces'sion,** in U.S., **3348;** beginning of doctrine, **14;** threats over Louisiana Purchase, **2073;** threatened by New England in War of 1812, **1883, 3347;** Calhoun's position, **575–6;** Daniel Webster, **3711;** Buchanan, **522;** Jefferson Davis, **968;** A. H. Stephens, **3353;** Lincoln, **2012–4;** Confederate States formed, **777, 857.**
**Secession, War of,** in U.S. *See in Index* **Civil War.**
**Seck'el pear, 2701.**
**Second,** in time, **797, 803;** in geometry, **1424.**
**Secondary cell,** which generates electric current after being "charged," **1113.**
**Secondary colors,** mixtures of primary hues, **837.**
**Second Empire,** in France, **1353.**
**Sec'retary.** Title of heads of executive departments in U.S. govt. *See in Index* departments by name, as **Agriculture, Commerce,** etc.
**Secretary bird, 3171.**
**Secre'tions,** in physiology, **1469–70, 3246.**
**Secre'tory nerves, 2437.**
**Secret Service,** U.S., **3597, 3598.**
**Section,** a unit of land measure, **1960, 3715.**
**Sec'ular clergy, 2300, 764.**
**Seda'lia,** Mo. Railroad center 95 mi. e. of Kansas City; pop. 21,144; r.r. shops, poultry, beef, pork-packing plants, and foundries.
**Sedan',** city in n. France; pop. 20,000; scene of decisive battle in Franco-Prussian War (1870); reached by Americans in World War just before armistice; **3171, 1356, 194.**
**Sedan chair,** origin of name, **3171;** used in China, **638.**
**Sedge,** a rush-like plant, **3171.**
**Sedgemoor,** England. Barren tract near Bridgewater, Somersetshire, where troops of James II defeated Monmouth (1685); called "last battle in England."
**Sedgwick, Anne Douglas** (born 1873). Amer. novelist (Mrs. Basil de Selincourt), b. Englewood, N.J.; lives abroad; work marked by shrewd character study ('Tante'; 'The Encounter').
**Sedimen'tary rocks,** those deposited from water, **1417, 3864;** source of petroleum, **2750.**
**Sedimenta'tion,** in geology, **1417.**
**Sedimentation process,** in water purification, **3703.**
**Seed plants** or **spermatophytes, 2822.**
**Seeds and spores, 3171–3;** albumen content, **83;** corn kernel, *picture,* **890;** fertilization, **1310, 1311;** in fruits, **1380;** germination of bean, **2827,** *pictures,* **348;** gymnosperm and angiosperm types distinguished, **3938;** oil content in cotton, **902;** peculiarities of the mangrove, **2135;** pine cones, *picture,* **2802;** scattering devices, **2827,** *pictures,* **2830;** seed selection in agriculture, **2830;** spores are forerunners, **92;** in water-plants, **3700;** in yellow waterlily, *pictures,* **474.**
**Seed-testing,** *picture,* **1396;** of corn, **890,** *picture,* **889.**
**Seeger, Alan** (1888–1916). Amer. poet; enlisted in Foreign Legion of France in World War, 1914, and was killed in action ('I Have a Rendezvous with Death').
**Seeland.** Same as **Zealand.**
**Seggar,** box of fire clay in which pottery is baked, **2905,** *picture,* **2907.**
**Segmented worms** or **annelids,** the highest type of worms, **3814, 3945.**
**Sego'via** (*sā-gō'vē-ä*), Spain, small city 40 mi. n.w. of Madrid; pop. 15,000; medieval religious center and seat of Castilian court; famous alcazar; Rom. aqueduct, *picture,* **163.**
**Segu** (*sā'gu̧*), town of Fr. Sudan on Niger R., formerly cap. of native Mohammedan kingdom; pop. 8500; **2507.**
**Segura** (*sā-gu̧'rä*). A river of s.e. Spain; 150 mi. to the Mediterranean.
**Seidl** (*zī'dl*), **Anton** (1850–98). Hungarian musical conductor; copyist for Wagner; immensely popular in New York (where he lived several years), especially as interpreter of Wagner's works.
**Seidlitz** (*sĕd'lits*) **powders** (named from Sedlitz, a village in Bohemia), **3116.**
**Seigniorage** (*sēn'yôr-āġ*), **2282.**
**Seine** (*sān*), a fish-net, **1285.**
**Seine River,** one of chief rivers of France; flows n.w. 482 mi. to English Channel; **3173–4, 1345;** harbor at Havre, **1601;** at Paris, **2681,** *picture,* **2682.**
**Seismograph** (*sīs'mō-grȧf*), instrument for detecting earthquake vibrations, **1066,** *picture,* **1065.**
**Seja'nus, Lucius Aelius** (d. 31 A.D.). A Rom. courtier, favorite of Tiberius; executed for plot to seize imperial power.
**Selachians** (*sē-lā'kĭ-ȧnz*), an order of scaleless fish with gristly skeletons; includes sharks, **3196,** skates or rays, **3244;** structure, **1271–2.**
**Selah** (*sē'lȧ*), term in Hebrew music, **2376.**
**Selangor** (*sā-läng-gōr'*), one of the Federated Malay States; 3156 sq. mi.; pop. 295,000; **2130.**
**Sel'borne,** parish in Hampshire, England, where Gilbert White wrote his 'Natural History of Selborne', **131.**
**Selden, John** (1584–1654). Eng. lawyer and scholar; active in political life but chiefly remembered for his 'Table Talk', an entertaining miscellany in essay form.
**Selective Service Act** (1917), **3801.**
**Selectmen,** officials of New England town, **3521.**
**Selene** (*sĕ-lē'nē*). Gk. moon-goddess, later identified with Artemis.
**Sel'enite,** a translucent gypsum, **1554.**
**Sele'nium,** a non-metallic element, **3174, 4042;** light-sensitive properties discovered, **2002–3.**
**Seleucia** (*sē-lū'shĭ-ȧ*), Babylonia, anc. city on Tigris R., s. of Bagdad; center of Gk. culture in Babylonia; destroyed by Romans (2d cent. A.D.); founded, **294.**
**Seleucid dynasty,** Syria, 312–64 B.C.; founded by Seleucus Nicator, son of one of Alexander's generals, **1656;** overthrown, **1657.**
**Self-determination,** a term brought into current use by President Wilson during the World War to denote the right of a people to determine its form of government and political allegiance, **2308.**
**Seligman, Edwin R. A.** (born 1861). One of the foremost Amer. economists; professor at Columbia Univ. since 1891; member of many public commissions and author of a number of standard books on economic problems.
**Selim III** (*sē'lim*) (1762–1808). Sultan of Turkey; administrative and military reformer; dethroned and killed by janissaries.
**Seljukian** (*sĕl-jŭ'kĭ-ȧn*) **Turks,** crusades against, **929–32, 3112.**
**Sel'juks.** Group of Turkish dynasties, descended from a chieftain named Seljuk, which ruled most of w. Asia 11th to 13th cents.; rule

in Persia marked by literary and artistic revival; superseded by Ottoman dynasty about 1300.

**Sel'kirk, Alexander** (1676–1721), a Brit. sailor, the original of 'Robinson Crusoe', **933–4, 986.**

**Selkirk, Thomas Douglas,** 5th **Earl of** (1771–1820), Scotch nobleman interested in colonization of Canada; founds Fort Garry, **3752, 2137.**

**Selkirk,** Manitoba. Shipping point for L. Winnipeg fishing industry on Red R. 23 mi. n. of Winnipeg; pop. 4000; govt. shipyards, cold storage plants, steel mfrs.

**Selkirk Mts.,** range in Canadian Rockies, British Columbia; highest peak 10,645 ft.; scenery, **512;** tunnel, **3552.**

**Selkirkshire.** County in s. Scotland; 267 sq. mi.; pop. 25,000; hilly country celebrated in literature; sheep-raising; cap. Selkirk.

**Sellers, Colonel Mulberry.** In 'The Gilded Age' by Mark Twain and Charles Dudley Warner, an optimistic speculator; "There's millions in it!"

**Selma,** Ala., city on Alabama R. 40 mi. w. of Montgomery; pop. 15,589; cotton and live stock section; cotton, iron, lumber, and creamery products; r.r. shops; Confederate arsenal and shipyard, **73.**

**Selous** (*sĕ-lo͞o'*), **Frederick Courtney** (1851–1917), Brit. explorer of S. Africa, ethnologist, and daring big-game hunter; secured Mashonaland territory for Britain 1890; captain in World War; killed in action; **38.**

**Selt'zer water** (named from Selters, a village in Prussia); how made, **642.**

**Semangs',** aboriginal people of Malay Peninsula, **2130.**

**Semaphore** (*sĕm'ȧ-fōr*) **signaling,** **3233, 3454,** *pictures.* **3232, 3455.**

**Sembrich** (*sĕm'brĭĸ*), **Marcella** (born 1858). Polish operatic soprano, noted for purity and brilliance of her voice; retired from stage 1900.

**Semele** (*sĕm'ĕ-lē*), in Gk. myth., mother of Dionysus, **1012.**

**Semicir'cular canals,** organs of equilibrium in ear, **1057,** *pictures,* **1056.**

**Sem'icolon,** use of, **2936.**

**Semilu'nar valve,** of heart, **1616.**

**Sem'inary Ridge,** important position in battle of Gettysburg, **1453, 1454.**

**Sem'inoles** ("Separatists"), tribe of N. Amer. Indians, originally part of Creeks; separated from tribe and settled in Florida; **1766, 1300;** wars in Florida (1817–18), **2306, 1856;** (1835–42), **3617, 1773;** removed to Indian Territory, **2576, 3153.**

**Semiramis** (*sĕ-mĭr'ȧ-mĭs*). Assyrian queen, in legend, half-divine wife and successor of Ninus, founder of Nineveh; herself great conqueror and ruler.

**Semites** (*sĕm'ītz*), branch of Caucasian race originating in s.w. Asia; in Africa, **37;** in Arabia, **165;** Jews, **1889;** Phoenicians, **2774;** Syrians, **3425;** in Tigris-Euphrates valley, **295, 296.**

**Semit'ic languages, 2771;** represented by Hebrew, **1624;** writing, **3817.**

**Semliki** (*sĕm'lĭ-kē*) **River,** in cent. Africa, **36.**

**Semlin** (*sĕm-lēn'*), Jugo-Slavia. City at confluence of Danube and Save rivers, opposite Belgrade; pop. 17,000; transit trade in timber and farm products.

**Semmes** (*sĕmz*), **Raphael** (1809–77). Confederate admiral, b. Charles County, Md., commander of the *Sumter* and of the most noted Confederate commerce destroyer, the *Alabama,* sunk by the *Kearsarge* off Cherbourg, France.

**Sempach** (*zĕm'päĸ*), a small town 10 mi. n.w. of Lucerne, Switzerland; battle (1386), **3752, 3415.**

**Sen'ate,** Canada, **621.**

**Senate,** France, **1351.**

**Senate,** anc. Rome, **3042, 3044, 3046,** *pictures,* **765, 3047.**

**Senate,** U.S., **860–2, 3593, 3594;** election of senators, **3428;** impeachment, **1740, 2914;** and political appointments, **555;** vice-president presides, **3637.** *See also in Index* **Congress of the United States.**

**Sen'ators, Palace of the,** Rome, *picture,* **3051.**

**Sendai** (*sän'dī*), Japan. City near e. coast of Honshu Isl. 190 mi. n.e. of Tokio; pop. 123,000; silk and lacquer mfrs.

**Seneca** (*sĕn'ĕ-kȧ*), **Lucius Annaeus** (3 B.C.–65 A.D.), Rom. statesman, philosopher, and dramatist, **2436. 1033, 1038.**

**Seneca Lake,** in w.-cent. New York; 36 mi. long; *map,* **2480.**

**Senecas,** Indian tribe of Iroquois confederacy; originally living about Seneca L., N.Y., later spread w. to L. Erie and s. along Allegheny R.; **1766.**

**Senefelder** (*zā'nĕ-fĕl-dĕr*), **Alois** (1771–1834), inventor of lithography, **2030.**

**Seneffe** (*sĕ-nĕf'*). Belgian town, 25 mi. s. of Brussels; French defeated William of Orange near by (1674).

**Senegal** (*sĕn-ĕ-ga͡l'*), colony in Fr. W. Africa, bordering Atlantic; 74,112 sq. mi.; pop. 1,205,000; cap. St. Louis; exports peanuts, hides, rubber, gums; *map,* **40–1.**

**Senegal,** river in Fr. W. Africa; flows 1000 mi. n. and w. to Atlantic; first r. for 1300 mi. s. of Morocco; *map,* **40–1;** rail connection with Niger, **2507.**

**Senegam'bia,** Fr. territory in W. Africa, including Senegal, upper Senegal, and Niger colonies, **37.**

**Senigallia.** Same as **Sinigaglia.**

**Senior lien bonds, 3359.**

**Sen'lac.** *See in Index* **Hastings, battle of.**

**Senlis** (*sŏn-lē'*), France. Small city, 25 mi. n. of Paris; Gaulo-Rom. walls, medieval cathedral; captured by Germans September, 1914.

**Sennacherib** (*sĕn-năk'ĕ-rĭb*), Assyrian king (reigned 705–681 B.C.), great builder and warrior, under whom "the Assyrian came down like a wolf on the fold" of Judea, **1890;** captures and razes Babylon, **298;** builds Nineveh, **298, 2510.**

**Sens** (*säns*), France. Industrial city on Yonne R., 65 mi. s.e. of Paris; pop. 15,000; Rom. remains; cathedral of St. Etienne.

**Sensa'tion,** in psychology, **2930;** nerves of, *picture,* **2437.**

**Senses, 2930;** hearing, **1056–7;** sight, **1213–6;** smell, **3252;** taste, **3440, 3513;** touch, **3520–1.**

**Sensitive plants, 3174, 2829, 855.**

**Sentence,** in grammar, **3174–5, 1492–4;** importance of verb, **3627.**

**Sentimental Tommy.** Hero of Barrie's novel of same name; interesting example of imaginative literary temperament.

**Sentinum** (*sĕn-tī'nŭm*), Italy, anc. city (modern Sentino), 37 mi. s.w. or Ancona; battle (295 B.C.), **3044.**

**Senus'sites.** A fanatical ascetic Mohammedan sect centering in the oasis towns of the eastern Sahara; founded 1837 by the Sheik es Senussi; have steadily resisted spread of European influence by force of arms; invaded w. Egypt, 1915–16.

**Seoul** (*sā-o͞l'*) or **Keijo** (*kā'jō*), cap. of Korea, near Han R., 19 mi. from Yellow Sea; pop. 300,000, Japanese 50,000; native mfrs. of silk, paper, tobacco; **1943.**

**Se'pals,** of flowers, **1305, 1306, 1981.**

**Sep'aratists,** English, **2937;** found Plymouth Colony, **2175–6.**

**Sep'arator, cream, 950, 682.**

**Se'pia,** dark brown pigment obtained from cuttlefish, **941, 942, 943, 2280;** ink, **1779–80.**

**Se'poy Rebellion** (Indian Mutiny) of 1857, **1753–4, 2075.**

**Septem'ber,** 9th month, **3175;** birthday stone, **1409.**

**Septic tank, 3183.**

**Septim'ius Seve'rus.** *See in Index* **Severus, Lucius Septimius.**

**Septuagint** (*sĕp'tū-ȧ-ĝint*). A Gk. version of Hebrew Bible, made according to tradition in 3d cent. B.C. by about 70 translators (Lat. *septuaginta,* "seventy"). Modern critics, however, believe work was done by different hands at separate times.

**Sepulcher** (*sĕp'ŭl-kĕr*), **The Holy,** in Jerusalem, **1885–6.**

**Sequatchie** (*sē-kwŏch'ī*), r. of s.e. Tennessee, flows into Tennessee R.; valley, **3466.**

**Sequoi'a,** genus of giant evergreen trees, **3175–6,** *pictures,* **585, 3176;** oldest living organisms, **3530;** Yosemite region, **3832.**

**Sequoia National Park,** Calif., in Sierra Nevada Mts., 160 mi. n. of Los Angeles; 161,597 acres; established to preserve sequoias (1890); **2400,** *maps,* **577, 578,** *picture,* **585;** and John Muir, **2365.**

**Sequoy'a** (1760?–1842). Indian inventor (George Guess), for whom the "big trees" are named; invented Cherokee alphabet.

**Seraglio** (*sā-rä'lyō*). The old palace of the sultan of Turkey at Constantinople; name also used as synonymous with "harem."

**Seraing** (*sē-răn'*), Belgium. Town on Meuse R. 4 mi. s.w. of Liége; pop. 38,000; one of largest machinery factories in Europe; reparation enforced for Ger. devastation.

**Serajevo** (*sā-rä-yā'vō*), Jugo-Slavia, cap. of Bosnia; 122 mi. s.w. of Belgrade; pop. 50,000; iron mines near by; metal mfrs.; trade center; Francis Ferdinand assassinated, **468;** street scene, *picture,* **309.**

**Serao** (*sā-rä'ō*), **Matilda** (born 1856), Ital. novelist, **2541, 1833.**

**Seraphim** (*sĕr'ȧ-fim*) or **seraphs.** Guardians of the threshold of the Most High (Isa. vi, 2–6); in later Christian and Jewish lore, highest angelic order.

**Serapis** (*sē-rā'pĭs*), Egypt. god worshipped in Gk.-Rom. towns of Egypt, **2602.**

**'Serapis',** Brit. warship, **1900–1.**

**Ser'bia,** a Balkan country now part of Jugo-Slavia; 42,100 sq. mi.; pop. 5,000,000; **3176–7, 1901–2,** *map,* **308;** cap. Belgrade, **376–7;** Danube R., **962;** national songs, **2405;** people, **3250, 3177.**—*History,* **3177, 377;** Balkan Wars, **310, 3790;** in World War, **3789, 3790, 3794–5, 3806–7.**

**Sereth** (*sĕr'ĕt*) **River,** an important tributary of the Danube in e. Rumania; 300 mi. long; *map,* **308.**

**Serfdom,** in Middle Ages, **3249, 1236;** Peasants' Revolt ends in England, **3571–2;** peonage in Span. Amer., **3249–50, 3288, 738, 836, 1079;** in Poland, **2856;** in Russia, **3090, 3091, 85, 3554;** in anc. Sparta, **3309.**

**Sergeant** (*sär'ĝȧnt*), in U.S. Army, **218;** insignia, **3576.**

**Sergeant-major,** insignia, *picture,* **3576.**

**Se'rial bonds, 3359.**

**Serinagur.** Same as **Srinagar.**

**Serous membrane.** Membranes forming closed sacs and moistened with a serous fluid which line certain cavities of the body; they are said to be reflected over the organ or organs contained in the cavity; the portion lining the cavity walls is called the parietal portion and the reflected portion, the visceral; the pleurae, the peritoneum, and the pericardium are examples.

**Serpent,** constellation, **873.**

**Serpent eagle** or **secretary bird, 3171.**

**Ser'pentine.** A mineral consisting of hydrated magnesium silicate rang-

ing in color from green to brown and sometimes yellow or red; often found in great masses; it takes a high polish; with calcite, magnesite, or dolomite it forms "ophiolite" or "verd antique," much used for pillars and ornamental work.

**Serpents.** *See in Indcx* **Snakes.**

**Serpent worship, 816, 3257.**

**Se'rum treatment** or **serum therapy, 151–2, 1452;** for hog cholera, **1671;** for snake bites, **3260.**

**Ser'val.** A large long-legged S. African wild cat (*Felis serval*) 3 ft. or more long, with yellow fur spotted and barred with black; the tail, 15 in. in length, is ringed with black; the fur is called "tiger cat."

**Servetus** (*sĕr-vē'tŭs*), **Michael** (1511–53), Span. physician (approached discovery of circulation of blood) and theologian (Unitarian, odious to Catholics and Protestants alike); burnt in Geneva as heretic, with Calvin's approval; **587.**

**Servia.** Same as **Serbia.**

**Service, Robert William** (born 1874), Canadian poet, b. Preston, England; sometimes called the Canadian Kipling ('The Spell of the Yukon'; 'Rhymes of a Rolling Stone'); **624.**

**Ser'vius Tul'lius** (578–534 B.C.), 6th king of Rome, **3041.**

**Ses'amum** or **ses'ame,** herb producing oil-seeds, **1751, 1779.**

**Sesostris** (*sĕ-sŏs'trĭs*). Gk. name of legendary Egypt. king and world-conqueror.

**Ses'tos,** anc. town in Thrace on Hellespont; w. terminus of Xerxes' bridge, **2739–40;** home of Hero, **1645.**

**Set,** in Egypt. myth., god of evil; brother and murderer of Osiris, **2602.**

**Seti** (*sā'tē*) **I** (about 1350 B.C.), Egypt. pharaoh of XIXth dynasty; built much of temple of Karnak; **1106.**

**Seto** (*sā'tō*), Japan, town near Nagoya, famous for pottery, **2387.**

**Se'ton, Ernest Thompson** (born 1860). Amer. naturalist, illustrator, and author, b. England ('Wild Animals I Have Known'; 'Lives of the Hunted'; 'Animal Heroes'); founded (1901) Woodcraft Indians, merged 1910 with Boy Scouts, of which he was chief scout 1910–15.

**Setter,** a hunting dog, **1022, 1023,** *picture,* **1022.**

**Settlement, Act of.** Same as **Succession, Act of.**

**Settlements, social.** *See in Indcx* **Social settlements.**

**Setubal** (*sā-tụ'bäl*), Portugal. Seaport and 3d city, 20 mi. s.c. of Lisbon; pop. 31,000; exports wine, fruit, salt, cork.

**"Seven cities contend for Homer dead," 1675.**

**Seven Cities of Cibola.** *See in Index* **Cibola.**

**Seven Days' Battles,** in Civil War (Mechanicsville, Gaines' Mill, Savage Station, Frazier's Farm, Malvern Hill), **2095.**

**Seven Pines, battle of.** *See in Index* **Fair Oaks.**

**Seven Sleepers.** In Medieval legend, 7 Christian youths of Ephesus who during persecution under Emperor Decius in 3d cent. hid in cave and there fell into a miraculous sleep that lasted nearly 200 years.

**Seventeen-year locust,** a cicada, **765.**

**Seventh Day Adventists.** Christian sect believing in the second coming of Christ in person and observing the seventh day as Sabbath; about 100,000 members in N. Amer.

**Seven Weeks' War** (1866), **1448, 428.** Bavaria, **347;** Hanover, **1576;** Saxony, **3132.**

**Seven Wise Men of Greece, 3275.**

**Seven Wonders of the World, 3177–9.** *See also in Index* each of the seven by name.

**Seven Years' War,** between Prussia and other European powers (1756–63), **3180–1;** expands Brit. Empire, **513;** effect on France, **2066;** Frederick the Great precipitates, **1360;** in America (French and Indian War), **1362;** in India, **1753, 573, 796, 382;** Maria Theresa, **2147;** Pitt's policies, **700.** *See also in Index* **French and Indian War.**

**Severn, Joseph** (1793–1879). Eng. painter, intimate friend of Keats, of whom he painted several portraits.

**Severn,** r. of England and Wales; rises in cent. Wales and winds s.c., then s.w., through s.w. England 200 mi. to Bristol Channel; canal connections, **3482.**

**Severn,** r. of n.w. Ontario, Canada; flows 350 mi. through Severn L. to s.w. side of Hudson Bay; **1690.**

**Severus** (*sĕ-vē'rŭs*), **Alexander.** *See in Indcx* **Alexander Severus.**

**Severus, Lucius Septimius** (146–211 A.D.), Rom. soldier-emperor, raised to throne by provincial legions 193 A.D.; spent reign chiefly in warfare; rebuilt Hadrian's wall in Britain; arch, *picture,* **3053.**

**Sevier** (*sē-vēr'*), **John** (1745–1815), Amer. frontiersman, first gov. of Tennessee, **3181, 3469.**

**Sevier Lake,** a salt lake in w. Utah, now dry for large part of each year; fed by Sevier R., but has no outlet; *map,* **3610.**

**Sevier River,** in w. Utah, flows n., then s.w. 200 mi. into Sevier L., *map,* **3610.**

**Sévigné** (*sā-vē-nyā'*), **Madame de** (1626–96), Fr. letter-writer, **3181, 3526.**

**Seville** (*sĕ-vĭl'*, Span. *sā-vēl'yā*), Spain, seaport on Guadalquivir R., 60 mi. from s. coast; pop. 165,000; **3181–2.**

**Sèvres** (*sĕ'vr*), France, suburb of Paris; pop. 8000; treaty between Allies and Turkey 1920; famous for porcelains, **2685, 2883.**

**Sèvres, Treaty of** (1920), **3557, 1662;** Dardanelles neutralized, **963.**

**Sewall** (*sū'ăl*), **Samuel** (1652–1730). Amer. jurist, b. Hampshire, England; managed only licensed printing press in Boston; one of commissioners who condemned 19 witches at Salem, for which he later took "the blame and the shame"; burial place, **470.**

**Sewanee** (*sē-wä'nē*), Tenn. Seat of Univ. of the South, 40 mi. n.w. of Chattanooga.

**Seward** (*sū'ērd*), **William Henry** (1801–72), Amer. statesman, sec. of state under Lincoln and Johnson, **3182,** *picture,* **2015;** purchases Alaska, **74, 1898;** attitude on emancipation, **1139.**

**Seward,** Alaska. Small town on Resurrection Bay in center of s. coast; s. terminal and winter headquarters of Alaska Northern R.R.

**Sew'erage, 3183;** Chicago Drainage Canal, **723–4;** plumbing, **2840.**

**Sewer-pipe,** how made, **505.**

**Sewing, 3183–6;** embroidery, **1140.**

**Sewing machine, 3186–8;** first model, *picture,* **1689;** invented by Howe, **1688–9, 3187;** made clothing industry possible, **805;** adapted to shoemaking, **3221.**

**Sex.** *See in Indcx* **Reproduction.**

**Sext,** a prayer, **2299, 2300.**

**Sex'tant, 2420, 1968,** *pictures,* **2421.**

**Sextet',** in music, **2584.**

**Seychelles** (*sā-shĕl'*). Archipelago of 90 isls. and islets in Indian Ocean, forming with tributary groups Brit. colony of Seychelles; 156 sq. mi.; pop. 25,000; largest isl. Mahé (55 sq. mi.) has cap. Victoria; export coconuts, vanilla, rubber, oil of cinnamon.

**Seymour** (*sē'mōr*) or **St. Maur.** Noble Eng. family; rose to power in Tudor times; heads became dukes of Somerset.

**Seymour, Horatio** (1810–86), Amer. statesman, b. Pompey, N.Y.; war gov. of New York (draft riots); defeated for president, **1499.**

**Seymour, Jane** (1509?–37), 3d queen of Henry VIII, **1636.**

**Sfax** (*sfäks*), Tunis, important seaport of Tunis; pop. 45,000; **3550.**

**Sforza** (*sfôr'tsä*), famous Ital. family; founded by a peasant condottiere (captain of adventurer band), whose son, Francesco Sforza (1401–66), conquered duchy of Milan and founded line of Sforza dukes; **2235, 2997.**

**'s Gravenhage,** original name of The Hague, **1558.**

**Sha** (*shä*) or **u'rial,** wild sheep, **3199.**

**Shackleton, Sir Ernest** (1874–1922), Brit. naval officer and antarctic explorer; in 1909 reached point about 97 mi. from S. Pole; sailed Sept. 1921 on 3d expedition but died on the way; **2863.**

**Shad,** a fish of the herring family, **3188, 1279, 1286.**

**Shad'dock,** a citrus fruit, **1500.**

**Shad-fly, 2178.**

**Shadoof** (*shä-dụf'*), Egypt. water-raising device, **1092,** *pictures,* **1093, 3696.**

**Shadwell, Thomas** (1642?–92), Eng. poet and playwright, chiefly remembered for quarrel with Dryden, who satirized him in 'MacFlecknoe'; **2848.**

**Shafter, William Rufus** (1835–1906), Amer. general, commander of U.S. expeditionary forces in Cuba in Span.-Amer. War.

**Shaftes'bury, Anthony Ashley Cooper,** first **Earl of** (1621–83), Eng. statesman; in Civil War fought first for king, then for Parliament; member of famous Cabal; lord chancellor; one of Carolina proprietors, **3292.**

**Shaftesbury, A. A. C.,** 3d **Earl of** (1671–1713). Celebrated moral philosopher, grandson of preceding ('Characteristics of Men, Manners, Opinions, and Times').

**Shaftesbury, A. A. C.,** 7th **Earl of** (1801–85), Liberal Conservative politician, philanthropist, and reformer; and child labor laws, **729.**

**Shagbark hickory, 1647;** nuts, *picture,* **1648.**

**Shagreen',** a leather; ass skin, **236;** of fishes, **3196, 3131.**

**Shah Jehan** (*shä yĕ-hän'*) or **Jahan** (d. 1666), Mogul emperor of Delhi; founder of modern Delhi; dethroned 1658 by his son Aurungzebe; **1752;** Pearl mosque and Peacock throne, **990;** Taj Mahal, **3429.**

**Shakers.** Name given, originally in derision, to religious sect (offshoot of Eng. Quakers) officially called "United Society of Believers in Christ's Second Appearing;" founded by Ann Lee, who emigrated from England with followers in 1774; advocate celibacy and Christian communism.

**Shake'speare, William** (1564–1616), the greatest of Eng. poets and dramatists, **3188–94, 1164, 1034,** *pictures,* **1164, 3188;** Bacon theory of authorship, **301;** chronology of plays, **3191;** development as dramatist, **3190–1;** early life, **3189;** home at Stratford-on-Avon, **3369,** *picture,* **3189;** plots from Plutarch, **2840;** quotations from, **3192–4, 1138, 1634, 2153, 3247;** sonnets, **3191;** theaters of his time, **3484,** *pictures,* **3191, 1034;** wide vocabulary, **1162.** —*Chief plays:* 'As You Like It', **224–5;** 'Hamlet', **1569–70;** 'King Lear', **1926;** 'Macbeth', **2094;** 'Merchant of Venice', **2199;** 'Midsummer Night's Dream', **2230;** 'Othello', **2603–4;** 'Romeo and Juliet', **3058;** 'The Tempest', **3465;** 'Winter's Tale', **3756–7.**

**Shale,** a stratified rock, **784, 1417, 1418;** in oil-yielding formations, **1408, 2755,** *picture,* **2751.**

**Shallot'**, an onion-like vegetable, **2581.**
**Shallow, Justice.** In Shakespeare's 'Merry Wives of Windsor', a self-important, foolish, ignorant country magistrate.
**Sha'manism,** a primitive religion of various cent. Asiatic peoples; teaches that all good and evil come from spirits, which can be influenced by priests called "shamans"; in Siberia, **2286.**
**"Shammy" leather, 686, 1976.**
**Shamo'.** Same as **Gobi.**
**Shamo'kin,** Pa. Borough 40 mi. n.e. of Harrisburg, in anthracite coal region; pop. 21,204; silk, foundry products, machinery, knit goods.
**Sham'rock, 3195, 2695.**
**Shan-a-lin Mts.,** in s. Manchuria on the Korean frontier; highest point 8000 ft.; **2134.**
**Shang'hai,** China, chief seaport of n. China, at mouth of Yangtze R.; pop. 1,200,000; **3195, 3827, 746,** *picture,* **747.**
**Shan'non,** r. in Ireland, longest in United Kingdom; rises in s.w. Ulster and flows 240 mi. s.w. to Atlantic, traversing series of lakes; **1807, 2010,** *map,* **1159.**
**'Shannon',** Brit. warship, **1973.**
**Shans,** a group of tribes of Burma, Siam, and China, **541.**
**Shansi** (*shän-sē'*). A n.-cent. province of China; 82,000 sq. mi.; pop. 10,000,000; cap. Taiyuan; coal, iron, copper, salt, fruit.
**Shantung** (*shän-tụng'*), province on c. coast of China; 56.000 sq. mi.; pop. 30,000,000; **3195–6;** birthplace of Confucius, **858;** density of population, **740;** World War and after, **3195–6, 1870, 3796, 3812.**
**Shantung silk, 3237, 3195.**
**Share,** of stock, **3358–9.**
**Shari** (*shä'rē*), r. in Africa, chief tributary of L. Chad; with its windings 1400 mi. long; **34,** *map,* **40–1.**
**Sharks, 3196–7,** *pictures,* **1273, 1276, 3197;** eggs, **1090,** *picture,* **1091;** evolutionary position, **128;** greatest length of, **1276;** skates and rays related, **1271–2.**
**Sharon** (*shăr'ŏn*), Pa. Mfg. and r.r. city on Shenango R., near Ohio line; pop. 21,747; coal and iron region; iron and steel products.
**Sharon, Plain of,** fertile plain in w. Palestine lying along Mediterranean between Joppa and Caesarea, **2643, 3425,** *picture,* **2646.**
**Sharon, Rose of.** *See in Index* **Rose of Sharon.**
**Sharp, Rebecca** ("Becky"). *See in Index* **Becky Sharp.**
**"Sharper than a serpent's tooth," 1926.**
**Sharp-shinned hawk, 1605, 1607,** *pictures,* **403, 1606;** nest, *picture,* **407.**
**Shas'ta, Mt.,** Calif., peak in Sierra Nevada Mts., near n. boundary; 14,380 ft.; **3231, 3580;** an extinct volcano, **3658;** why its cone is steep, **1972.**
**Shasta daisy, 538.**
**Shat-el-Arab** (*shät-ĕl-ä-räb'*), name of the Euphrates R. after its junction with Tigris; flows s.e. 120 mi.; **1187, 3499, 2738.**
**Shaw, Anna Howard** (1847–1919), Amer. suffrage leader and minister (first woman ordained by Methodists), credited with large share in passage of U.S. suffrage amendment; b. England; **3778.**
**Shaw, George Bernard** (born 1856), Brit. dramatist, critic, and essayist, fearless, witty, brilliant iconoclast, **1036;** chief works, **1038.**
**Shaw, Henry Wheeler.** *See in Index* **Billings, Josh.**
**Shaw, Robert Gould** (1837–63), Amer. soldier, b. Boston; memorial by Saint-Gaudens, **3107.**
**Shawenegan** or **Shawinigan** (*shä-wĕn-ä-gän'*) **Falls,** Quebec, town on St. Maurice R. 20 mi. above Three Rivers; pop. 11,000; falls 150 ft. high furnish water-power for mfrs. of aluminum, manganese, carbide; falls, *picture,* **2947.**
**Shawls, cashmere, 1477, 653.**
**Shawnee',** Okla., commercial and industrial city 35 mi. s.e. of Oklahoma City; pop. 15,348; r.r. shops, cotton oil mills and gins; **2578.**
**Shawnee** or **Shawano Indians,** tribe of N. Amer. Indians of Algonquian stock; originally lived in Wis., but in 17th and 18th cents. were several times defeated by Iroquois and driven principally to S.C. and Tenn.; now in Okla., **2576;** Tecumseh chief, **3451–2, 1594.**
**Shaw's Garden,** St. Louis, **3110.**
**Shays, Daniel** (1747–1825), Amer. soldier, b. Hopkinton, Mass.; leader of "Shays' Rebellion," **3197.**
**Shays' Rebellion, 3197.**
**Shears,** in metal-working machinery, **3516.**
**Shear steel, 1824.**
**Shearwater,** a swimming bird, **2747.**
**Sheath-bill,** a white wading bird of Antarctic, with horny sheath over nostrils, *picture,* **2716.**
**She'ba, Queen of,** queen of great beauty, mentioned in Bible (I Kings, x); frequently regarded as ruler of Sabaeans in s. Arabia; visits Solomon, **3274.**
**Sheboy'gan,** Wis., port on L. Michigan and Sheboygan R. 50 mi. n. of Milwaukee; pop. 30,955; furniture, leather, enamel ware; shipping, **3772.**
**Shechem** (*shē'kĕm*), anc. city of Palestine, 80 mi. n. of Jerusalem; connected with traditions of Abraham, Jacob, and later Hebrew history; modern Nablus, pop. 28,000; **2643.**
**Sheep, 3198–3200;** altitude range, *picture,* **397;** anthrax immunization, **1450, 2692;** in Australia, **264,** *picture,* **263;** dogs as herders, **1019–20;** effect of breeding, *picture,* **49;** eye, *picture,* **1215;** fossil ancestors, **1336;** leathers, **1977, 1475, 686;** liver fluke parasite, **3813;** meat-packing, **2180;** milk, **2238;** in Montana, *picture,* **2310;** New Mexico, **2465;** New Zealand, **2499;** number killed by dogs, **1023;** Patagonia, **3285, 3286;** Scotland, **3146;** S. Africa, **3283;** Spain, **3300;** Uruguay, **3608;** U.S., **3588;** wool, **3782–7;** Wyoming, **3820.**
**Sheep, Rocky Mountain.** Same as **Bighorn.**
**Sheep dogs, 1019–20.**
**Sheepshank,** a hitch used for shortening rope, **1939.**
**Sheepskin, 1977, 1475;** sold as chamois, **686;** parchment, **2667.**
**Sheeps-wool sponge, 3330.**
**Sheep tick,** *picture,* **2679.**
**Sheerness'.** Port and naval arsenal in Kent, England, at confluence of Thames and Medway rivers; pop. 18,500.
**Sheet lightning, 2007.**
**Shef'field,** England, iron and steel mfg. city of Yorkshire on Don R.; pop. 495,000; **3200.**
**Sheffield plate, 3200.**
**Sheffield steel, 1824.**
**Sheffield University,** Sheffield, England, **3200.**
**Sheik** (*shēk*), Arabian tribal leader, **165.**
**Shek'el.** Anc. unit of weight and coin of same weight, used by Babylonians, Phoenicians, and Jews; Hebrew gold shekel worth about $10, silver 75 cents.
**Shelby, Isaac** (1750–1826). Amer. soldier of Rev. War and War of 1812; first gov. of Kentucky.
**Sheldon, Charles M.** (born 1857). Amer. Congregational clergyman, b. Wellsville, N.Y.; long pastor at Topeka, Kan.; amazingly popular author; 'In His Steps', a novel, has been translated into 24 languages; editor-in-chief *Christian Herald.*
**Sheldon, Edward Brewster** (born 1886), Amer. playwright, b. Chicago; chief plays, **1038.**
**Sheldrake,** a fish-eating duck, **1046.**
**Shelf, continental.** *See in Index* **Continental shelf.**
**Shell,** artillery projectile, **634, 635;** gas shell, **1408.**
**Shell,** of animals, **3200–3;** in button mfr., **549;** chalk formation, **685;** of crustaceans, such as crawfish, **915;** of gastropods, **2280–1;** made into cameos, **591;** of nautilus, **2418;** oyster, **2614,** *picture,* **2615;** pilgrim badge, **2807, 3134;** of protozoans, **2927;** snail, **3255, 3256.**
**Shell,** a racing boat, **444,** *picture,* **445.**
**Shellac',** the purified resin-like secretion (lac) of scale insects, **3133, 1954;** in hat-making, **1597;** in varnish, **3619, 2643.**
**Shellbark hickory.** Same as **Shagbark.**
**Shel'ley, Percy Bysshe** (1792–1822), Eng. poet, **3204;** leader in literary revolt, **1166;** quoted, **155.**
**Shelley, Mary** (1797–1851). Eng. author, 2d wife of P. B. Shelley, daughter of Mary Wollstonecraft Godwin. *See in Index* **Frankenstein.**
**Shellfish.** *See in Index* **Crustacea; Mollusks.**
**Shell money, 3202.**
**Shell shock, 2930–1.**
**Shem.** Eldest son of Noah; traditional ancestor of Semitic peoples (Gen. x).
**Shenando'ah,** Pa. Borough 100 mi. n.w. of Philadelphia; pop. 24,726; center of rich anthracite coal region; cigars, powder, garments, knit goods.
**Shenandoah River,** Va., tributary of Potomac, **2902,** *map,* **3650.**
**Shenandoah Valley,** Va., picturesque valley between Blue Ridge and Allegheny Mts., **158, 3650;** Civil War campaigns, **1858, 3204–5.**
**Shensi** (*shĕn-sē'*). Province in n. China; 75,200 sq. mi.; pop. 8,000,000; fertile loess plateau in n.; cent. plain drained by Wei R.; mts. in s.
**Shepard, Helen Gould** (born 1868), Amer. heiress and philanthropist, daughter of Jay Gould; donates Hall of Fame, **1566.**
**Shepherd Kings.** *See in Index* **Hyksos.**
**'Shepherd of Hermas',** apocryphal book of Bible, **390.**
**Sher'aton, Thomas** (1751?–1806), after Chippendale most famous Eng. furniture designer, **1384;** furniture, *picture,* **1385.**
**Sher'brooke,** Quebec. Port and mfg. city at confluence of Magog and St. Francis rivers, 85 mi. s. of Montreal; pop. 22,500; ships asbestos, lumber, wood; makes machinery, textiles.
**Shere Ali** (*shēr ä'lē*) **Khan** (1825–79). Amir of Afghanistan; defeated in war with Gt. Brit. (1878) and dethroned.
**Shere Khan,** the Tiger, in Kipling's story of Mowgli, **1927–9.**
**Sher'idan, Philip Henry** (1831–88), Amer. Civil War general, **3204–5.**
**Sheridan, Richard Brinsley** (1751–1816), Brit. wit, dramatist, and statesman, friend and ally of C. J. Fox ('The School for Scandal', masterpiece of satiric comedy; 'The Rivals'), **1036;** and Dr. Johnson, **1899.**
**Sheridan,** Wyo., city near n. border; pop. 9175; **3822.**
**Sheriff.** In the U.S., chief executive officer of a county; charged with maintaining the peace, executing laws, and serving judicial writs and processes.
**Sherman, James Schoolcraft** (1855–1912), vice-president of U.S. 1909 to death; b. Utica, N.Y.; **3636.**
**Sherman, John** (1823–1900), Amer. financier and statesman, younger brother of Gen. W. T. Sherman, b.

Lancaster, Ohio; U.S. senator from Ohio 1861–77, 1881–97; as sec. of treasury (1877–81) under Hayes, provided for resumption of specie payments in 1879; Anti-Trust Act, **1592, 3546;** Silver Act, **1592.**
**Sherman, Roger** (1721–93), Amer. Rev. statesman; in Fedcral Constitutional Convention helped reconcile large-state and small-state parties; at various times member of Connecticut legislature, judge of state superior court, representative in Congress and U.S. senator; **975, 3593.**
**Sherman, William Tecumseh** (1820–91). Amer. Civil War general, **3205–6;** at Atlanta, **254;** Chattanooga, **700–1;** Johnston surrenders to, **2521.**
**Sherman,** Tex. Industrial and trade city in Red R. valley, 55 mi. n. of Dallas; pop. 15,031; cotton-growing, stock-raising, and farming district; cotton products, flour, cigars; several collcges.
**Sherman Anti-Trust Act, 1592, 3546.**
**Sherman Silver Purchase Act, 1592.**
**Sherry,** wine, origin of name, **3302.**
**Sherwood Forest,** England, hilly district in Nottinghamshire; former royal hunting forest, now largely divided into private parks and farms; retreat of Robin Hood, **3032.**
**She'shonk** or **Shi'shak I** (10th cent. B.C.), Egyptian king of 22d dynasty, **1655.**
**'She Stoops to Conquer',** comedy by Goldsmith, **1484.**
**Shet'land Islands,** group n.e. of Scotland, constituting a Scotch county; 550 sq. mi.; pop. 26,000; **3206,** *maps,* **1152–3, 1159.**
**Shetland pony, 1685,** *picture,* **1684.**
**Shetucket River,** Conn., a stream uniting with the Quinebaug to form the Thames, *map,* **864.**
**Shield,** armor, **214,** *pictures,* **215;** heraldic devices, **1639.**
**Shield,** in tunnel construction, **3551–2.**
**Shields, North,** England. Port on n. bank of Tyne R., near mouth, opposite S. Shields; incorporated with adjacent Tynemouth.
**Shields, South,** England. Port on s. bank of Tyne R.; pop. 116,000; iron and shipbuilding center with supplemental shipping industries; enormous docks; exports coal.
**Shi-Hwang-ti** (259–210 B.C.), "first cmperor" of China; king of Ts'in who overthrew feudal system and established centralized govt. over all China; to break opposition to reforms ordered burning of all historical books; Great Wall, **744–5,** *picture,* **741.**
**Shiites** (*shē'its*), Mohammedan sect, **2278, 2736.**
**Shikoku** (*shē-kō'kų*), one of principal isls. of Japan; 6907 sq. mi.; *map,* **1864.**
**Shilling.** An Eng. silver coin worth 12 pence, or 24 cents in U.S. money.
**Shiloh** (*shī'lō*). Anc. town 20 mi. n. of Jerusalem; contained sanctuary of ark of the covenant.
**Shiloh** or **Pittsburg Landing, battle of** (1862), in Amer. Civil War, **3206–7;** Grant, **1498;** Sherman, **3205.**
**Shimonoseki** (*shē-mŏ-nō-sā'kē*) or **Akamagaseki,** Japan. Fortified port on s.w. end of main isl.; pop. 68,000; r.r. terminus and shipping point; bombarded by foreign vessels 1864; treaty ending Chino-Japanese War 1895.
**Shi'nar, Plain of,** anc. name for Babylonia, **295.**
**Shingles, 2082.**
**Shin oak, 752.**
**Shin'toism** or **shinto,** primitive religion of Japan, **2994, 1868;** forbidden occupations, **1869;** priests, *picture,* **1867.**
**Shipbuilding, 3214–8,** *pictures,* **3211, 3212;** armor-plate, **216;** Belfast, **371;** Hamburg, **1568;** steel construction introduced, **2428, 1174, 3212;** Scotland, **3146;** use of spruce timber, **3332;** welding, **3716;** Wilmington, Del., **3743.**
**Ship'ka Pass,** Bulgaria. Pass through Balkan Mts. n.e. of Philippopolis; forced by Russians in Russo-Turkish War (1877–78).
**Ship-money,** old Eng. tax imposed on maritime counties to pay for ships in time of war; attempt of Charles I to levy it upon all of England as regular tax was a contributing cause of Civil War; **692, 1570.**
**"Ship of the desert,"** camel, **588–91.**
**Shipping,** distribution of world's, **3219.**
**Shipping Board,** U.S., **3748;** develops concrete ship, **3218.**
**Ships, 3207–20;** armor-plate, **216;** barnacles, **331;** battleships, **2422–8;** early history, **3207–8, 3524,** *picture,* **3525;** Fulton builds first successful steamship, **1381;** Great Lakes freighters, **3218, 1513,** *pictures,* **1512, 811;** gyroscopic stabilizers, **1555;** Hudson's *Half Moon,* **1690,** *picture,* **1691;** insurance, **1792;** lightships, **2005–6;** *Mayflower* (model), *picture,* **2175;** modern shipbuilding, **3214–8;** navigation, **2420–2;** Norse ships, **3208,** *picture,* **2526;** ocean commerce, **853, 3218;** *Old Ironsides, picture,* **2423;** rigging, **3209;** sailing vessels, **3208–10;** screw propeller, **1174, 3212, 3214,** *picture,* **3213;** signaling, **3233;** steamships, **3210–2;** tank-steamers, **2754;** *Titanic, picture,* **1722;** turbine engines, **3554, 3212;** U.S. shipbuilding in the World War, **3803, 3214–5, 3218, 3219.** *See also in Index* **Commerce; Navigation; Navy.**
**Ship's log,** for measuring speed, **2045,** *picture,* **2046;** journal or record book, **2046.**
**Shipworm** or **teredo,** a bivalve, **3201.**
**Shiraz** (*shē-räz'*), s. Persia, trade center 120 mi. n.e. of Bushire in high valley; pop. 50,000; home of Hafiz, Sadi, and other great Persian writers; products, **2733, 2734.**
**Shire,** administrative division in Gt. Brit., **906.**
**Shire,** a heavy type of horse, **1685,** *picture,* **1684.**
**Shire** (*shē'rā*) **River,** Brit. E. Africa, from end of L. Nyaza s. 370 mi. to Zambezi R.; only tributary of Zambezi navigable from sea; **1069.**
**Shirley, James** (1596–1666). Eng. dramatist, link between Elizabethan and Restoration periods; wrote about 40 plays ('The Traitor'; 'Hyde Park').
**Shirley, William** (1694–1771). Colonial governor of Massachusetts, b. Preston, England; organized expedition which took Louisburg (1745); succeeded Braddock as commander-in-chief of Brit. forces in America.
**Shiva.** Same as **Siva.**
**Shock, electric,** first aid for, **1270.**
**Shoddy, 3782.**
**Shoe-bill stork,** *picture,* **3362.**
**Shoes, 3220–3;** buttons for, **550;** leather and its preparation, **1975–9;** repairing clogs in Japan, *picture,* **1869;** rubber, **3072, 3076;** selection and care of, **1714, 597;** sizes, how numbered, **3714;** U.S. mfrs., **2165, 2087, 3109.**
**"Shoestring Republic," 735.**
**Shogun** (*shō'gųn*), former commander-in-chief of Japanese armies and virtual ruler, **1868, 1862.**
**Shonts, Theodore Perry** (1856–1919). Amer. r.r. president, b. Crawford County, Pa.; chairman 1905–07 Isthmian Canal Commission.
**Shooting stars, 2202.**
**Shore, Jane** (d. 1527). Favorite of Edward IV of England; accused by Richard III of witchcraft; imprisoned; died in want.
**Shore birds.** *See in Index* **Limicolae.**
**Shore crab,** *pictures,* **912.**
**Short ballot, 321.**
**Shorthand, 3224–5.**
**Shorthorn,** breed of cattle, **663.**
**Short Parliament,** in Eng. history. Parliament sitting from April 13 to May 5, 1640; followed by Long Parliament in November.
**Shorts,** in flour milling, **1303.**
**Short story, 2541.**
**Short ton, 3714, 3715.**
**Shoshone** (*shō-shō'nē*) **Dam,** Wyo., **954, 3820.**
**Shoshone Falls,** cataract in Snake R., s. Idaho, **1725,** *picture,* **1728.**
**Shoshone Indians,** tribe of plateau Indians formerly ranging through Idaho and s. Oregon, **1767;** guide Lewis and Clark, **1989;** reservation, **2445.**
**Shoshone River,** tributary of the Big Horn in n.w. Wyoming; *map,* **3820;** dam, **954, 3820.**
**Shot, 1973–4;** arsenic in, **220.**
**Shotgun, 1256–7.**
**"Shot heard round the world," 1990.**
**Shoulder,** region where the arm joins the body; bones, **3245;** muscles, *picture,* **2372.**
**Shoveler duck** or **spoonbill, 1044,** *picture,* **1045.**
**Shoyu** (*shō'yŭ*) or **soy sauce, 3297.**
**Shrap'nel,** an artillery projectile, **635,** *picture,* **634.**
**Shreve'port,** La., 2d city of state; pop. 43,874; on Red R. in n.w.; r.r. and distributing center for oil, gas, and farming region; cotton, foundry products, lumber; **2070, 2071.**
**Shrew,** an insectivorous mammal, **2279;** foot of water shrew, *picture,* **1323.**
**Shrewsbury** (*shrōz'bĕr-i*). England. Old city, cap. of Shropshire, on Severn R.; pop. 30,000; famous school founded by Edward VI; Henry IV defeated and killed Hotspur (1403).
**Shrike,** a carnivorous bird, **3225,** *pictures,* **419, 403.**
**Shrimp,** a small crustacean, **3225;** in Louisiana, **2070.**
**Shropshire.** Eng. county on Welsh border; 1343 sq. mi.; pop. 240,000; noted for sheep.
**Shropshire sheep, 3200,** *picture,* **49.**
**Shrove Tuesday, 1070.**
**Shu-kiang** or **Chu-kiang** ("Pearl River"). Same as **Canton River.**
**Shu'shan.** Same as **Susa.**
**Shuster, William Morgan** (born 1877), Amer. lawyer and financial expert, b. Washington, D.C.; treasurer-general and financial adviser to Persia, **2737.**
**Shuttle,** in weaving, **904,** *pictures,* **3238, 3786;** Cartwright's, **652;** "flying," **3327;** in sewing machine, *picture,* **3187.**
**Shylock,** in Shakespeare's 'Merchant of Venice', avaricious Jewish money-lender, **2199,** *picture,* **3194.**
**Siam** (*sī-ăm'*), independent country of Indo-Chinese peninsula; 200,000 sq. mi.; pop. 9,000,000; **3226–7, 1777,** *maps,* **232–3;** cap. Bangkok, **326;** gems, **1409, 1410;** monsoons, **3751;** woman suffrage, **3779.**
**Siam, Gulf of,** arm of Pacific Ocean partly inclosed by Indo-China and the Malay Peninsula, **228, 3226,** *map,* **232–3.**
**Siamese cat, 658.**
**Siamese Twins, the** (1811–74), Eng and Chang, twins born in Siam of Chinese father and Siamese mother; joined together by cartilaginous band; **510.**
**Sianfu** (*sē-ăn-fų'*), **Singanfu,** or **Siganfu,** China. Walled city on Wei R. 400 mi. n.w. of Hangkow; pop. 500,000; famous Nestorian tablet; important trade center for cent. Asia.
**Sibelius** (*sē-bā'lĭ-ŭs*), **Jean Julius Christian** (born 1865). Finnish composer; music largely founded on folk melodies of Finland ('Karelia'; 'Romance in C'; 'Valse Triste'; symphonies).

**Sibe'ria,** a country of Asiatic Russia extending from Ural Mts. to Pacific; 4,832,000 sq. mi.; pop. over 10,000,000; **3227–9,** *map,* **232–3;** Arctic regions, **189–90;** black earth belt, **3086;** caravan trade, **228;** climate, **3228, 2973;** Cossacks, **895–6;** elevation, *map,* **232–3;** Eskimos, **1174–7;** furs, **2155, 3228, 3334, 3498;** history, **3229, 1853;** Kamchatka, **1907;** people, **3229, 2286, 3440;** population, **226, 230,** *map,* **232–3;** prehistoric animals, **2132, 1853;** rainfall, *map,* **232–3;** reindeer, **2993, 226;** rivers, **3228, 230;** Rus. Turkestan, **3555–6;** steppes and forests, **230;** transportation, **2963, 3228;** tundra, **226;** Ural Mts., **3606–7;** vegetation, *map,* **232–3;** Vladivostok, **3652–3;** wheat, **3732, 2973.**
**Siberian mammoth,** 2132.
**Siberian Railway,** 2963, 3228.
**Siberian sable-marten,** 2155.
**Siberian tiger,** 3498.
**Sib'ylline books,** 3229, 3041.
**Sibyls** (*sĭb'ĭlz*), prophetesses in Gk. and Rom. legend, **3229.**
**'Sic et Non',** book by Abelard, **2.**
**Sicil'ian Vespers,** massacre of French in Sicily (1282), **3230.**
**Sicilies, Kingdom of the Two,** 3230, 2391. *See also in Indcx* **Naples; Sicily.**
**Sicily** (*sĭs'ĭ-lĭ*), isl. belonging to Italy, separated from mainland by Strait of Messina; 9935 sq. mi.; pop. 3800; **3229–30,** *maps,* **1196–7, 1836,** (anc.) **1518;** early silk culture, **3235;** earthquake of 1908, **1066, 3230,** *picture,* **1065;** Mt. Etna, **1185;** sulphur production, **3389.** —*History,* **3230;** colonized by Greeks, **1520;** Pyrrhus in, **2941, 3044;** in Punic Wars, **651;** Rome conquers, **3046;** Norman kingdom, **1195, 2391;** annexed to Holy Roman Empire, **1633;** under Frederick II, **1358;** taken by Garibaldi, **1399, 1837;** joins united Italy, **3638.** *See also in Index* **Syracuse.**
**Sickles, Daniel Edgar** (1823–1914). Amer. general, b. New York City; raised a brigade at beginning of Civil War; fought at Antietam, Fredericksburg, Chancellorsville; lost leg and won Congressional Medal of Honor at Gettysburg; minister to Spain 1869–73, and later active in New York politics.
**"Sick Man of Europe,"** 3559.
**Siddhattha Gotama** (*sĭd-hät'thä gō'-tä-mä*) (Buddha), **524.**
**Sid'dons, Mrs. Sarah** (1755–1831), Eng. tragic actress, greatest of the Kemble family and school; unequaled 'Lady Macbeth'; painted by Reynolds as the 'Tragic Muse'; portrait by Gainsborough, *picture,* **2636.**
**Sidereal** (*sī-dē'rē-ăl*) **time,** 3502, 969.
**Sid'erite,** an iron ore, **1817.**
**Side-saddle plants,** 2811.
**Side stroke,** in swimming, **3410,** *picture,* **3411.**
**Sidney, Algernon** (1622–83). Eng. Rev. leader; beheaded for supposed complicity in Rye House Plot.
**Sidney, Sir Philip** (1554–86), Eng. poet, statesman, and soldier, mortally wounded at Zutphen, where, it is said, he gave his last cup of water to a dying soldier, saying "Thy need is greater than mine"; 'Arcadia', **2539.**
**'Sidney',** Brit. warship, **2423.**
**Sidon** (*sī'dŏn*) or **Zidon,** anc. Phoenician city on Mediterranean (modern Saida), 25 mi. s. of Beirut; noted for glass; vast commerce; **2774;** captured in World War, **3807.**
**Siege** (*sēj*), in Middle Ages, **654–6.** *See* list of famous sieges below.
**Siegfried** (*sēg'frēd*), hero of 'Nibelungenlied', **3230–1, 2504.**
**Siemens** (*sē'mĕnz*), **Werner von** (1816–92). Ger. inventor; suggested use of gutta-percha in insulating underground and marine cables; inventor of many electrical improvements and pneumatic tube system.
**Siemens, Sir William** (1823–83). Brit. inventor, b. Germany, younger brother of preceding; with Werner von Siemens invented Siemens armature; with Friedrich, another brother, invented Siemens regenerative furnace; many other inventions.
**Siemens-Martin** or **open-hearth process,** 1826, 1802.
**Siena** (*sē-ĕn'ä*) or **Sienna,** Italy, mfg. and trade city 30 mi. s. of Florence; pop. 43,000; famous Gothic cathedral; Sienese school of art; univ.; annexed to Florence, **2191;** Guelfs defeated (1260), **1293;** Pisano's pulpit, *picture,* **1201.**
**Sienkiewicz** (*shĕn-kyā'vĭch*), **Henryk** (1846–1916), Polish novelist, 1905 Nobel prize winner in literature ('Quo Vadis', most famous novel, tale of Rome under Nero, translated into more than 30 languages; 'With Fire and Sword', 'The Deluge', 'Pan Michael'—great historic trilogy of 17th cent. Poland); **2541.**
**Sierra Blanca** (*sē-ĕr'ä blăn'kä*), a mt. range in s. Colorado; Blanca Peak is highest summit; **3036.**
**Sierra de Gata** (*gä'tä*). Chain of mountains in Spain and Portugal separating the valleys of the Tagus and Douro rivers.; 5690 ft.
**Sierra de Gredos** (*grā'thōs*), mountain range of cent. Spain; 8730 ft.; *map,* **3300.**
**Sierra de Guadarroma** (*gwä-thä-rä'-mä*), mounain range of cent. Spain separating Old and New Castile; 7900 ft.; *map,* **3300.**
**Sierra Leone** (*lā-ō'nā*), Brit. colony and protectorate on w. coast of Africa; colony, 4000 sq. mi.; pop. 76,000; chief town, Freetown; protectorate, inland, 27,000 sq. mi.; pop. 1,328,000; exports ginger, palm nuts, and oil, kola nuts; **513,** *maps,* **40–1.**
**Sierra Madre** (*mä'drā*), Arizona, **3580.**
**Sierra Madre,** Mexico, name of two mountain ranges forming the eastern and the western walls of the great cent. plateau, **2209.**
**Sierra Maestra** (*mä-ä'strä*), Cuba, **936,** *map,* **938.**
**Sierra Morena** (*mō-rā'nä*), low mountain range of s. Spain; rises slightly above Iberian plateau to the north and drops sharply on the s. to valley of the Quadalquivir; *map,* **3300.**
**Sierra Neva'da** ("snowy range"). Loftiest mountain range in Spain; extends about 60 mi. e. and w. through Andalusia and Granada near Mediterranean coast; highest peak, Mulahacen, 11,420 ft.; luxuriant vineyards and orchards on s. slopes.
**Sierra Nevada,** loftiest mountain range in U.S., **3231,** *map,* **577,** *pictures,* **583, 584;** e. slope caused by "fault," **1064;** effect on climate of Nevada, **2444;** explored by John Muir, **2365;** Mt. Whitney, **3736;** sequoias, **3175–6;** Yosemite valley, **3831–2.**
**Sieyès** (*syā-yĕs'*), **Emanuel Joseph, Abbé** (1748–1836). Phrase-maker of Fr. Rev.; published 1788 celebrated pamphlet beginning "What is the Third Estate? Everything. What has it been? Nothing."

## SOME FAMOUS SIEGES OF HISTORY

| Name | Date | Duration | |
|---|---|---|---|
| Adrianople | 1912–13 | 155 days | Turks besieged by Bulgarians. Fell. |
| Antwerp | 1584–85 | 14 months | Belgians besieged by Spaniards under Prince of Parma. Fell. |
| | 1830–32 | 15 months | Dutch garrison besieged by populace. Surrendered. |
| Arcot | 1751 | 50 days | 120 British and 200 Sepoys under Clive besieged by 150 French and 10,000 Sepoys. Raised. |
| Candia | 1667–69 | 2 years | Venetians besieged by Turks. Fell. |
| Carthage | 148–146 B.C. | 2 years | Carthaginians besieged by Romans. Fell. |
| Constantinople | 673–677 | 5 years | Byzantines besieged by Saracens. Raised. |
| | 717–18 | 1 year | Same as above. |
| | 1453 | 54 days | Byzantines besieged by Turks. Fell. |
| Delhi | 1857 | 131 days | Indian mutineers besieged by British. Fell. |
| Gibraltar | 1779–81 | 3 yrs., 7 mos., 12 days | British garrison besieged by Spaniards. Raised. |
| Jerusalem | 637 | 4 months | Mohammedans led by Omar invested Byzantine forces. Fell. |
| Ladysmith | 1899–1900 | 118 days | Boers besieged British. Relieved. |
| La Rochelle | 1627 | 1 year | Richelieu besieged French Huguenots. Fell. |
| Leyden | 1574 | 4 months | Spaniards besieged Dutch. Raised after Duteh eut dikes. |
| Lucknow | 1857 | 149 days | British under Lawrenee, later under Haveloek, besieged by Indian mutineers. Relieved. |
| Mantua | 1796–97 | 8 months | Napoleon besieged Austrians. Fell. |
| Mafeking | 1899–1900 | 217 days | Bocrs besieged British garrison under Baden-Powell. Relieved. |
| Orleans | 1428–29 | 10 months | Freneh besieged by English. Relieved by Joan of Arc. |
| Ostend | 1601–04 | 3 years | Flemish besieged by Spanish. Surrendered. |
| Paris | 1870–71 | 135 days | Besieged by Germans. Surrendered. |
| Plevna | 1877 | 144 days | Turks besieged by Russians and Rumanians. Surrendered. |
| Port Arthur | 1905 | 241 days | Russian garrison surrendered to Japanese. |
| Przemysl | 1914–15 | 185 days | Russians besieged Austrians under Kusmanek. Surrendered. |
| Richmond | 1864–65 | 287 days | Confederates besieged by Federals. Evaeuated. |
| Sebastopol | 1856 | 335 days | Russians besieged by Allies. Fell. |
| Syracuse | 214–212 B.C. | 2 years | Besieged by Romans under Marcellus. Fell. |
| Tyre | 585–572 B.C. | 13 years | Besieged by Nebuchadnezzar II. Raised. |
| Troy | 12th or 13th cent. (?) B.C. | 10 years | Greeks besieged Trojans. Fell. |
| Vieksburg | 1862–63 | 186 days | Confederates invested by Federals under Grant. Fell. |

**Siffleur** (*sĭf-flûr'*). **Rocky Mountain,** animal named for its whistling call; lives above timber line; **1647.**
**Sifton, Arthur Lewis** (1858–1921). Canadian jurist and statesman, first chief justice of Alberta 1905–10; provincial premier 1910–17; brother of Sir Clifford.
**Sifton, Sir Clifford** (born. 1861). Canadian statesman; prominent in Manitoba politics after 1888; Dominion Minister of Interior 1896–1905; after 1909 chairman Dominion Conservation Commission; in coalition cabinet 1917–21 and one of Canadian signers Treaty of Versailles.
**Sigel** (*sē'gĕl*), **Franz** (1824–1902), Amer. soldier, b. Germany; major-general in Civil War, active in keeping Missouri in union and fought at Pea Ridge, 2d battle of Bull Run, Shenandoah valley campaigns; in Ger. Rev. of 1848, **3737.**
**Sigeum** (*sĭ-jē'ŭm*), **Cape,** anc. lighthouse, **2004.**
**Sighs, Bridge of.** *See in Index* **Bridge of Sighs.**
**Sight.** *See in Index* **Eye.**
**Sigismund** (*sĭj'is-mŭnd*) (1368–1437), Holy Roman emperor, succeeded 1410; caused convocation of Council of Constance, which ended the Great Schism 1417; **2086, 2928;** Huss and Hussite War, **1705;** ruled Luxemburg, **2086.**
**Sigma Xi** (*sĭg'mà zī*), an honor fraternity, **828.**
**Signal Corps,** U.S. Army, **3233, 217, 3599;** insignia, *picture,* **3576.**
**Signaling, 3231–3;** electric telegraph, **3454–8;** fireworks, **1266;** old methods, **3454;** railroad, **2969–70;** weather flags, **3708;** wireless telegraphy, **3758–67.**
**Signatu'ra, Apostolic,** supreme tribunal of Rom. Catholic church, **2666.**
**Sig'nature,** of a book, **458, 460.**
**Signs of zodiac, 3840.**
**Sigs'bee, Charles Dwight** (born 1845). Amer. rear-admiral; in command of battleship *Maine* when destroyed in Havana harbor (1898); commander of *St. Paul* in Span.-Amer. War; introduced numerous inventions and new methods in deep sea exploration; retired 1907.
**Sigs'bee's Deep,** in Gulf of Mexico, **1548.**
**Sigurd** (*sē'gŭrd*). Norse hero who plays in the Volsunga Saga the part taken by Siegfried in the Nibelungenlied.
**Si-hu,** lake near Hangchow, **1574.**
**Sika** (*sē'kà*), Japanese species of deer, **981.**
**Sikes** (*sīks*), **Bill.** In Dickens' 'Oliver Twist', brutal thief; kills Nancy, his mistress, and maltreats Oliver.
**Sikhs** (*sēks*), a religious sect of India, **1749;** in Cashmere, **653;** defeated, **1753;** enameling, **1755;** police, **3195,** *picture,* **2867.**
**Si-kiang** (*sē-kē-äng'*) ("West River"), largest stream in s.w. China; 1250 mi. long; enters China Sea through many-mouthed delta near Canton; *map,* **740.** *See also in Index* **Canton River.**
**Si'lage.** *See in Index* **Silos.**
**'Silas Marner',** novel by George Eliot; story retold, **1135–6.**
**Sile'nus,** a satyr, **1012.**
**Silesia** (*sĭ-lē'shĭ-à*), region in cent. Europe embracing province of Silesia in Czecho-Slovakia (formerly Austrian Silesia) and Prussian Silesia; in 1914 area was 18,000 sq. mi.; pop. 6,000,000; after World War about one-fourth of Upper Silesia, including most of its iron, zinc, and coal areas, was ceded to Poland by Germany following plebiscite; **270, 1439, 1443, 1444, 2856, 3812,** *map,* **1440;** seized by Frederick the Great, **1360, 2147, 3180,** *map,* **2929.**
**Silesian wars, 2147.**
**Silica** (*sĭl'i-kà*), silicon dioxide, **3233–4;** in cement, **674;** chemical action in glass-making, **10;** in clay, **784;** in flint, **1292;** as glass-furnace lining, **1471;** in quartz, **2945.**
**Sil'icates,** salts of silicic acid, **3234;** of aluminum, **1230, 2219;** contain bulk of world's potassium, **2899;** in feldspar, **1230;** of magnesium (talc), **3430;** in mica, **2219.**
**Silicic** (*sĭ-lĭs'ĭk*) **acid, 3234.**
**Sil'icon,** a non-metallic element, **3233–4, 4042;** abundance in earth, **711,** *picture,* **1058;** dioxide (quartz), **2945;** transmits electricity in one direction, **3761;** used in invar, **2507.** *See in Index* **Silica; Silicates.**
**Si-Ling-Shi,** legendary Chinese empress, **3234.**
**Silistria** (*sĭ-lĭs'trĭ-à*). Trade town in s.c. Rumania, on Danube R.; pop. 12,000; Rom. Durostorum; former fortress, frequently besieged.
**Silk, 3234–40;** bleaching, **435;** fabrics, **804;** fiber, *picture,* **1560;** Japan, **1864, 1866,** *picture,* **1868;** Lyons, France, **2092;** mulberry food of silkworms, **2365–6, 3235;** Spain, **3302, 3615;** from spider-threads, **3325;** U.S. manufacture, **2694, 3153, 2720;** wild silks, **3237, 3195.**
**Silk, artificial, 3240, 673, 906.**
**Silk hats, 1597.**
**Silkworm, 3236–7, 3240,** *pictures,* **545, 3234;** how it breathes, *picture,* **2998;** mulberry food, **2365–6.**
**Sill, Edward Rowland** (1841–87). Amer. poet and essayist, b. Windsor, Conn.; his poetry notable for careful diction, delicate feeling, and spiritual optimism ('Hermione and Other Poems'; 'The Venus of Milo and Other Poems').
**Silliman, Benjamin** (1779–1864). Noted Amer. chemist and geologist; professor at Yale Univ.; founded and edited *American Journal of Science;* a beloved and honored teacher rather than a profound scientist.
**Siloam** (*sī-lō'ăm*). Pool in Jerusalem, forming part of anc. water supply; fed by tunnel from "fountain of the Virgin"; in wall is cut oldest known Hebrew inscription.
**Si'los and silage, 3240,** *picture,* **842;** soy beans, **3297;** sunflowers, **3397.**
**Silt,** earthy sediment deposited by water; in land formation, **3023.** *See in Index* **Alluvial soil.**
**Silu'rian period,** in geologic time, **1418,** *picture,* **1419.**
**Silver,** a precious metallic element, **3240–3, 4042;** anc. Gk. mines at Laurion, **1527;** alloys, **99, 3242;** assaying, **236;** electroplating, **1125;** melting point, **1362;** Mexico, **2210;** money, **2281–2;** N. Amer., **2516;** salts used in photography, **2780–1;** S. Amer., **3289, 449, 450;** Spain, **3302;** stamp mill, *picture,* **1728;** tarnished by sulphur, **3389;** U.S., **1727, 2309, 2445, 3612.**
**Silver, free coinage of,** in U.S.; coinage of silver dollar stopped (1873), **1499, 3606;** Bland-Allison Act restores silver coinage (1878), **1611;** Populist attitude, **2871;** Sherman Silver Act (1890), **1592;** Cleveland opposes, **791;** Bryan and election of 1896, **520, 2104;** gold standard adopted (1900), **2104.**
**Silver cat,** *pictures,* **657, 659.**
**Silver City,** N.M., health resort and mining center in s.w.; pop. 2662; **2466, 2467.**
**Silver fir, 1248.**
**Silver fox, 1337, 1389, 1390.**
**Silver fulminate,** an explosive, **3242.**
**Silver maple, 2138.**
**Silver nitrate,** an antiseptic, **3242;** used for backing mirrors, **2261.**
**Silver salmon, 3113–4.**
**Silver-tip,** a grizzly bear, **350.**
**Silverware, 3242;** electroplating, **1125;** Ger. silver, **2507;** Sheffield plate, **3200;** sterling, **99;** tarnishing, **3389.**
**Silviidae.** Same as **Sylviidae.**
**Simcoe, John Graves** (1752–1806), Eng. soldier and first lieut.-gov. of Upper Canada (1792–96), **2057.**
**Simcoe, Lake,** Canada, 30 mi. long, 18 mi. wide; 160 sq. mi.; empties into L. Huron through Georgian Bay; **627.**
**Sim'eon.** Second son of Jacob; traditional ancestor of tribe of Simeon.
**Simeon Stylites** (*stī-lī'tēz*) (4th–5th cent.), Syrian monk, first and most famous of the "Pillar Saints," who lived on high pillars, **150.**
**Simferopol** (*sĭm-fĕr-ō'pŏl*), Russia. Town in s.w. Crimea; pop. 85,000; former Tatar Akmetchet; famous for fruit.
**Simile** (*sĭm'ĭ-lī*), a figure of speech, **1238.**
**Simla** (*sĭm'là*), in the Punjab, India, summer cap., 170 mi. n. of Delhi; in Himalaya Mts.; altitude of 7000 ft.; resident pop. 15,000; **1745, 1650.**
**Simmons College,** at Boston, Mass.; for women; founded 1899 by John Simmons; opened 1902; household economics, secretarial and library courses; general science, philanthropic work, industrial teaching, salesmanship; **2170, 830.**
**Simms, William Gilmore** (1806–70), Amer. man of letters, b. Charleston, S.C.; except Poe most notable literary Southerner before Civil War; prolific writer of poems, plays, novels, historical sketches, and contributions of every kind to periodicals ('Atalantis', his strongest poem; 'Martin Faber', the story of a criminal; 'Yemasee', an Indian tale of colonial Carolina; lives of Francis Marion, Nathanael Greene, and Capt. John Smith).
**Simon** (*sē-môN'*), **T.,** Fr. psychologist, **1793.**
**Simonides** (*sī-mŏn'ĭ-dēz*) (556–469 B.C.). Gk. lyric poet, a finished craftsman, but not a great imaginative poet; celebrated the heroes of his own day in a great variety of metrical structure.
**Simon Magus** (*sī'mŏn mā'gŭs*). Samaritan sorcerer, converted to Christianity, who offered Peter and John money for the power of the Holy Ghost (Acts viii).
**Simon Peter** (Saint Peter), **2745, 157.**
**"Simon Says,"** game, **2838.**
**Simony** (*sĭm'ō-nĭ*). Purchase of spiritual benefit or church preferment, named from sin of Simon Magus.
**Simon Zelo'tes,** the apostle, **157.**
**Simple leaves, 1982.**
**Simple microscope, 2228.**
**Simplified spelling, 3314.**
**Sim'plon tunnel, 3552, 3413.**
**Simpson, Sir James Young** (1811–70), Scotch physician; aroused historic storm of religious and medical censure by using anesthetic in child-birth; invented acupressure in hemorrhage; anesthetics, **124.**
**Simpson College.** At Indianola, Iowa; co-ed., Meth. Episc.; founded 1867; liberal arts, normal courses, business, shorthand and typewriting, music, oratory, art; military drill and science.
**Sims, Vice-Admiral William Sowden** (born 1858), Amer. naval officer, **3243;** in World War, **3803.**
**Sinai** (*sī'nă-ī*) or **Horeb, Mt.,** Biblical locality often identified with group of peaks in Sinai peninsula at head of Red Sea; copper mines, **2251;** Moses receives Ten Commandments, **2333,** *picture,* **1889;** musical sands, **3122.**
**Sinai peninsula,** between Gulf of Suez and Gulf of Akabah, **2986,** *map,* **1095.**
**Sinait'ic manuscript, 390.**
**Sinaloa** (*sē-nä-lō'ä*), Mexico. State in n.w. on Pacific; 27,557 sq. mi.; pop. 330,000; cap. Culiacan; mining and agriculture.

**Sinbad the Sailor,** hero of one of the 'Arabian Nights', **168.**
**Sinclair, May.** Contemporary Eng. novelist; skilful at psychologic dissection ('The Tree of Heaven'; 'Mary Olivier'; 'The Romantic'; 'Mr. Waddington of Wyck').
**Sinclair, Upton** (born 1878). Amer. novelist and social reformer, b. Baltimore; 'The Jungle' led Roosevelt to order investigation of packing industry; wrote numerous novels and books on social and economic problems ('King Coal', a novel of the Colorado strike; 'The Profits of Religion'; 'The Brass Check', an exposure of Amer. journalism).
**Sind,** plain of India, 46,986 sq. mi.; pop. 3,513,435; **1778, 1746, 3104;** temperature, **1747.**
**Singapore** (*sĭn-gȧ-pōr'*), island city at tip of Malay Peninsula, commercial center of s. Asia; pop. 300,000; **3243, 2131,** *picture,* **2130;** pepper-center of world, **2723.**
**"Sing a song of sixpence,"** origin, **2340.**
**"Singeing the Spanish king's beard," 210.**
**Singer, Isaac M.** (1811–75), Amer. inventor, b. Oswego, N.Y.; sewing machine, **3187.**
**Singing, 2376–8, 2379;** "diaphragm breathing," **1005;** how vocal organs function, **3657.**
**Singing sands, 3122.**
**Singing statue** of Memnon, *picture,* **1105.**
**Single entry bookkeeping, 5–7.**
**Single tax, 3442.**
**Sing Sing.** *See in Index* **Ossining.**
**Sing Sing State Prison,** *picture,* **2918.**
**Sinhalese'** or **Ceylonese, 685.**
**Sinigaglia** (*sē-nē-gä'lyȧ*) or **Senigallia.** Ital. port on Adriatic n. of Ancona; pop. 6000; anc. Rom. Sena Gallica; formerly of great importance.
**Sinkiang** (*sĭn-kĭ-äng'*), province of w. China, including Chinese Turkestan; 550,000 sq. mi.; pop. 2,500,000; dry region but fruit, cereals, and cotton raised by irrigation; **740, 3555,** *map,* **232–3.**
**"Sink lakes," 1957.**
**Sinks,** or beds of disappearing rivers, **3580.**
**Sinn Fein** (*shĭn fān*), Irish revolutionary party, **1811.**
**Si'non,** friend of Odysseus, **3544.**
**Sinope** (*sĭ-nō'pē*) or **Sinub,** port in Asia Minor; best harbor on s. shore of Black Sea; pop. 9000; anc. Gk. colony; Russians destroyed Turk. fleet (1853); exports timber, dried fruits, skins, and silk; **434, 1011.**
**Siouan** (*sụ'ȧn*) **Indians,** one of the largest and most widely extended linguistic stocks of N. Amer. Indians, occupying chiefly the great plains area; often called the Plains Indians; **1766–7.**
**Sioux** (*sụ*) or **Dakotahs,** an Indian tribe of Siouan stock, with possible exception of Ojibwa the largest tribe in U.S.; Custer massacre, **2312, 3822;** give name to Dakota, **2525;** reservation, **3296;** uprisings, **528, 1773, 2257, 2432.**
**Sioux City,** Iowa. Mfg. and jobbing city on w. border on Missouri and Big Sioux rivers; pop. 71,227; packed meat, flour, sashes and doors, brick and tile; Morningside College.
**Sioux Falls,** S.D., commercial and industrial center of state, in s.e. on Sioux R.; pop. 25,176; packed meats, confectionery, foundry products; stone quarries; **3297, 3296.**
**Si'phon,** in hydraulics, **3243;** in aqueducts, *picture,* **164.**
**Siphon,** organ of mollusks, **2280;** of clam, **782;** of cuttlefish, **941–2;** of octopus, **2559.**
**Siphonap'tera,** the flea order of insects, **1788.**
**Siphon pen** or **recorder, 558.**
**Si'phuncle,** tube connecting shell chamber of nautilus, **2418.**
**'Sir Charles Grandison',** novel by Richardson, **2540.**
**Sire'nia,** an order of aquatic mammals such as the manatee, **2134.**
**Si'rens,** in Gk. myth., sea nymphs who lured mariners to destruction, **2562–3.**
**Sirius** (*sĭr'ĭ-ŭs*), the dog star, **3342,** *charts,* **873, 3343.**
**'Sirius',** early steamship, **3210.**
**Sir'loin, 2185.**
**Sirocco** (*sĭ-rŏk'ō*), a wind, **3751.**
**Sisal** (*sĭs'ȧl*), a Mexican fiber, **3244, 1630,** *picture,* **2214;** plant belongs to agave genus, **42.**
**Sisters of Mercy, 2544.**
**Sistine** (*sĭs'tēn*) **Chapel,** private papal chapel in Vatican built by Pope Sixtus IV, **3055;** Michelangelo's frescoes, **2220, 2222, 3229.**
**'Sistine Madonna',** painting by Raphael, **2976, 2108,** *picture,* **2635.**
**Sisyphus** (*sĭs'ĭ-fŭs*), in Gk. myth., king condemned forever to roll stone up hill, **3244.**
**Sit'ka,** Alaska, seaport on Baranof Isl. 350 mi. n.w. of Vancouver, British Columbia; pop. 1200; cap. until 1906; lumbering, mining, salmon canning; climate, **77.**
**Sitka deer, 981.**
**Sitka spruce, 3333.**
**Sit'tidae,** nuthatch family of birds, **412.**
**Sitting Bull** (1837?–90), Sioux Indian chief, leader of band which massacred Custer and his forces (1876), **1773–4, 3296, 3822.**
**Siut** (*sē-ụt'*), Egypt. Same as **Assiut.**
**Siva** (*sē'vȧ*), Hindu god, **1651, 486;** Giant Bull of, *picture,* **1749.**
**Siwa** (*sē'wä*) or **Siwah,** oasis in Libyan Desert; in anc. times seat of the oracle of Jupiter Ammon; *map,* **1095.**
**Six Nations,** confederation of Amer. Indians, **1766.**
**"Six-shooter,"** a revolver, **1256.**
**Six'tus IV** (Francesco della Rovere) (1414–84), pope, elected 1471; built famous Sixtine or Sistine Chapel; hostile to Medici, **2191.**
**Sixtus V** (Felice Peretti) (1521–90). Pope, elected 1585; reformed abuses in Rome, limited number of cardinals to 70, and re-established discipline in the church.
**Sizing, 1476, 2668.**
**Skagen** (*skä'gĕn*), Denmark, cape at n. tip of Jutland, **996.**
**Skag'errack,** arm of North Sea between Denmark and Norway, **2528, 2529, 321,** *map,* **2531.**
**Skagit River,** rising in Cascade Range, British Columbia; flows into Puget Sound, Wash.; *map,* **3687.**
**Skag'way,** Alaska, town at head of Lynn Canal in s.e.; pop. 404; near White Pass; distributing point for supplies for interior and port for Canadian Klondike; railway, **1933.**
**Skansen,** park of Stockholm, Sweden, **3358.**
**Skates,** various fish of the ray family, **3244.** *See also in Index* **Rays.**
**Skating,** sport, **3753,** *pictures,* **3754, 3755;** Davos rink, *picture,* **3413;** skate-sailing in Norway, *picture,* **2532.**
**Skeat** (*skēt*), **Walter William** (1835–1912). Eng. philologist, authority on Middle English, edited Chaucer and 'Piers Plowman' ('Etymological English Dictionary').
**Skeena,** r. in n.w. British Columbia; flows w. about 400 mi. to Pacific; **513,** *maps,* **602–3, 616.**
**Skel'eton,** the framework of an animal's body, **3244–5;** birds, **400;** bone tissue, **452;** crawfish, **916;** insects, **1784;** mollusks, **2280–1;** sharks, **3196, 1271–2;** sponge, **3329.**
**Skellefte,** r. of Sweden flowing into Gulf of Bothnia; *map,* **2531.**
**'Sketch Book, The',** by Washington Irving, **1831.**
**Skibbereen',** Ireland, town in extreme s.w. on Ilen R. near coast; scene near, *picture,* **1809.**
**Skiing** (*skē'ing*), winter sport, **3754,** *pictures,* **3401, 3755.**
**Skimmer** or **scissorbill.** A family of sea-birds including 5 species, of which the black skimmer (*Rynchops nigra*), 16 to 20 inches long and with white under parts and glossy black upper parts, is the only Amer. bird; the upper mandible is movable and the lower mandible, thin as a knife, is much longer than the upper and is used to skim the surface of the water for food.
**Skin,** covering tissue of an animal, **3245–6,** *picture.* **1451;** senses, **3520–1;** shape of cell, **672;** why soap cleans, **3263;** of spider, *picture,* **3323;** tattooing, **3440;** warts, **3673.**
**Skink,** a lizard, **2037,** *picture,* **2038.**
**Skinner, Otis** (born 1858). Amer. actor, b. Hartford, Conn.; played with Augustin Daly and Mme. Modjeska; since 1895 star and producer of romantic plays ('Kismet'; 'Cock o' the Walk'; 'Mister Antonio'; 'The Honor of the Family'); a finished actor who blends humor and sentiment.
**Skipjack,** a click-beetle, **369.**
**Skirts, 900–1;** origin, **897;** *pictures,* **898–900.** *See also in Index* **Costume.**
**Skoplje** (*skôp'lyĕ*). *See in Index* **Uskup.**
**Skull,** bony parts of the head, **3245;** basis for classification of mankind, **2956, 149;** modified in birds, **400;** phrenology, **2784.**
**Skunk, 3246;** fur, **1389, 1390.**
**Skunk turtle, 3563.**
**Skutari** (*skụ'tä-rē*). Same as **Scutari.**
**Sky,** why it is blue, **52;** clouds, **809,** *pictures,* **808;** personified by Greeks, **3607;** rainbow, **3311.**
**Skye** (*skī*), largest of Inner Hebrides; 643 sq. mi.; noted for scenery; **1625,** *map,* **1159.**
**Skye terrier, 1022, 1023.**
**Skylark, 1963;** courtship flights, **405;** foot, *picture,* **409.**
**Sky-rockets,** fireworks, **1264–6.**
**Skyscraper, 529–31,** *pictures,* **529, 188, 2487, 2489;** architectural value, **189;** in New York City, **2489;** origin, **725.**
**Sla'den, Douglas** (born 1856). Australian writer, b. London ('Australian Lyrics').
**Slag,** waste matter formed in metal smelting, **1820,** *picture,* **2583;** formed in assaying, **236;** in cement, **674;** as fertilizer, **1235.**
**Slaked lime,** calcium hydroxide ($Ca(OH)_2$), **2010, 571.**
**'Slander',** a Little Talk by Arthur Mee, **3247.**
**Slang, 3248.**
**Slate,** a rock that splits into thin slabs, **3248;** formation, **784,** *picture,* **1421.**
**Slate Islands.** Group of 5 small isls. off coast of Argyllshire, Scotland, at entrance to Firth of Lornc; slate quarries, worked since 1630, yield about 8 million slates yearly.
**Slater, John F.** (1815–84), Amer. philanthropist; fund for negro education, **1610.**
**Slater, Samuel** (1768–1835), Amer. textile manufacturer, b. England; cotton mill in Rhode Island, **3007, 1218;** his wife, **3493.**
**Slave Coast.** Coast on Gulf of Guinea between Niger and Volta rivers; formerly resort for slave traders.
**Slave** or **Great Slave Lake,** in n.w. Canada; 10,000 sq. mi.; **2102, 604.**
**Slave** or **Great Slave River,** name given to portion (300 mi.) of Mackenzie R. of Canada, **2102, 2698, 2699.**
**Slavery, 3248–50;** Africa, **33, 37, 38, 2035, 3249, 3250, 3280;** Babylonia **296;** Cent. Amer., **679;** Egypt, **176,** *picture,* **178;** Greece, **1522, 3309,**

**3248, 3249;** Rome, **3044, 3047, 3248, 3249, 3310;** S. Amer., **3288, 495, 2434, 1547.**
*In U.S.*, **3249, 2434, 3604–5, 776–7;** J. Q. Adams, **15–16;** Benton, **384;** John Brown, **516, 1913;** Buchanan, **522;** Calhoun, **575–6;** Compromise of 1850, **855–6, 576, 384, 1240, 2802, 3444;** Confederate States formed, **857;** Douglas, **1027, 2017;** Dred Scott decision (1857), **1039, 522, 777, 2017;** Emancipation Proclamation, **1139–40, 778, 2014,** *picture,* **2015;** Fillmore, **1240;** Franklin, **1358;** Fugitive Slave Law, **1240;** Garrison, **1400–1;** Greeley, **1538;** Kansas-Nebraska Act (1854), **1913, 2012, 777, 1027, 3392, 2802;** Lemmon Case, **222;** Lincoln, **2012, 2014, 2017;** Mason and Dixon's line, **2164;** Mexican War intensifies issue, **2207, 2208, 2872;** Missouri Compromise (1820), **2273, 2272, 777, 786;** New England colonial trade, **2927;** political issue, **2870, 2871;** Polk, **2872;** prohibited in Northwest Territory (1787), **2529;** Seward, **3182, 1139;** Sumner opposes, **3391–2;** trade abolished (1808), **1883;** 'Uncle Tom's Cabin' published (1852), **3368;** Webster, **3711;** Whittier, **3736.**
*See also in Index* **Civil War; Negro.**
*In West Indies,* **1965, 3718, 2442;** Cuba, **937;** Haiti, **1561;** Jamaica, **1860;** Porto Rico, **2887.**
**Slavo'nia.** *See in Index* **Croatia-Slavonia.**
**Slavon'ic** or **Slav languages, 3096, 2771.**
**Slavs,** a racial division of e. Europe, **3250, 2956;** costumes, **2857–8, 533,** *picture,* **2856;** Czechs, **447, 948;** Jugo-Slavia, **1901–2;** Russia, **3088–9;** Serbs, **3176–7.**
**Sled** or **sledge, 3756;** Eskimo, **1176–7;** Russian, *picture,* **3085.**
**Sleep, 3250–1;** compared to hibernation, **1646, 1647;** hypnotic, **1717–8.**
**Sleeping car, 2965.**
**Sleeping sickness,** a discase causing lcthargy and death; carried by tsetse fly, **3546–7;** caused by protozoa, **1450;** in Congo basin, **34;** in Uganda, **1068.**
**Sleep-walking, 3251.**
**Sleepy Hollow, 1831.**
**Sleet, 1559.**
**Sleight** (*slīt*) **of hand, 2121.**
**Slide,** stereopticon, **3354.**
**Slidell** (*slī-dĕl'*), **John** (1793–1871), Amer. lawyer and diplomatist, Confederate commissioncr to Gt. Brit.; U.S. seizes, **3539.**
**Slide rule, 196.**
**Slide valve,** of stcam cnginc, **3351.**
**Slime molds,** a type of primitive organisms, **3251, 2822;** classified, **3938, 3944.**
**Sling-fruits, 3171.**
**Slip,** potter's clay, **2903–4.**
**Slip knot, 1939,** *picture,* **1938.**
**Slipper shell, 3201,** *picture,* **3203.**
**Slippery elm, 1138–9.**
**Slivers,** textile fibers in loose strands; cotton. *picture,* **903;** rope, **3065,** *picture,* **3064;** wool, *pictures,* **3784.**
**Slo'cum, Henry Warner** (1827–94). Amer. general in Civil War, b. Delphi, N.Y.; fought in all the Virginia campaigns, and in battle of Chattanooga; commanded Atlanta garrison and took part with Sherman in march to sea; later a member of Congress.
**Sloe** (*slō*) or **blackthorn, 3251.**
**Sloop,** a sailing vessel, **3209.**
**Sloth,** a tree-living mammal, **3252;** altitude range, *picture,* **397;** foot, *picture,* **1323;** giant fossil type, **138.**
**Slotter,** a machine tool, **3514.**
**Slough** (*slou*) **of Despond,** in 'Pilgrim's Progress', **535.**
**Slovak'ia,** province in e. Czecho-Slovakia, formerly part of Hungary; 19,173 sq. mi.; pop. 2,953,000; **947–8, 1703,** *map,* **947.**
**Slovaks** (*slō-văks'*), a Slavic people, **948, 3250.**
**Slovenes** (*slō-vēns'*), a Slavic people, **1902, 3250.**
**Slovenia** (*slō-vē'nĭ-ȧ*) or **Slovinia,** constituent part of Jugo-Slavia; 6790 sq. mi.; pop. 875,000; includes portions of former Austrian territory of Carniola, Carinthia, Styria, and Istria; **1901–2.**
**Slow-worm,** a lizard, **2037.**
**Slugs,** shell-less, snail-like mollusks, **3255–6.**
**Sluice** (*slųs*), in lumbering, *picture,* **2078;** placer mixing, *picture,* **265.**
**Sluys** (*slois*) or **Sluis, battle of,** French defeated off Dutch coast by Eng. and Flemish fleets under Edward III (1330), **1700.**
**Smalkal'dic.** Same as **Schmalkaldic.**
**Small arms, 1252–7.**
**Smallpox,** a disease; former prevalence, **1614;** supposedly caused by germs, **1450;** vaccination, **3613.**
**Smalt,** a blue pigment, **816.**
**Smalt'ite,** ore containing cobalt and arsenic, **816.**
**Smartweed,** or water-pepper, annual herb (genus *Polygonum*) which grows in wet places; so called from acrid juice which will inflame tender skin; **2416.**
**Smell,** sense of, **3252;** in cats, **658;** contributes to taste, **3513.**
**Smelling salts,** chemical composition, **118;** for fainting, **1270.**
**Smelt,** a food fish, **1279.**
**Smelting,** copper, *pictures,* **882–3;** iron, **1820.**
**Smeta'na, Friedrich** (1824–84). Bohemian composer and pianist, called the "Czechisch Beethoven" ('The Bartered Bride').
**Smethwick** (*smĕth'ĭk*), England. Mfg. center 3 mi. n.w. of Birmingham; pop. 75,000; iron products, machinery, glass, chemicals.
**Smike.** In Dickens' 'Nicholas Nickleby', half-witted, half-starved boy at Dotheboys Hall, befriended by Nicholas.
**Smi'lax** or **greenbrier,** a shrubby climbing or trailing plant related to lilies; one type yields sarsaparilla, **3127.** Name also given to ornamental twining plant from S. Africa.
**Smiles, Samuel** (1812–1904). Scotch biographer and didactic essayist ('Self-Help'; biographies of Watt, Stephenson, Wedgwood, and other industrial leaders).
**Smith, Adam** (1723–90), Scotch political economist; founder of modern economics, **1078, 210;** on free trade, **3437;** on taxation, **3441.**
**Smith, Caleb Blood** (1808–64), secretary of the interior in Lincoln's cabinet (1861–2), *picture,* **2015.**
**Smith, Edmund Kirby** (1824–93). Amer. Civil War (Confederate) general, commander from 1863 of Trans-Mississippi Dept.; last Confederate general to surrender.
**Smith, Francis Hopkinson** (1838–1915). Amer. civil engineer, artist, and novelist. ('Colonel Carter of Cartersville', portrait of an old-school Southern gentleman; 'Caleb West, Master Diver').
**Smith, Sir Francis Pettit** (1808–74), Eng. inventor, **3212.**
**Smith, Goldwin** (1824–1910), Canadian scholar, historian, and journalist, b. England ('Irish History'; 'The United Kingdom'; 'Reminiscences'), **625.**
**Smith, Hyrum** (d. 1844), brother of Joseph Smith, Mormon prophet, **2326–7.**
**Smith, Captain John** (1580–1631), Amer. colonial adventurer, **3252–3, 1861;** writings, **3253, 111;** monument in Richmond, Va., **3019.**
**Smith, Joseph** (1805–44), founder of Mormonism, **2326–7.**
**Smith, Samuel Francis** (1808–95), Amer. scholar and Baptist clergyman; b. Boston, Mass.; author of 'America', **2404–5.**
**Smith, Sydney** (1771–1845). Eng. clergyman and author; firm friend of religious toleration, and a famous wit; called Macaulay a "book in breeches," and compared House of Lords rejecting Reform Bill of 1831 to Mrs. Partington trying to mop up the Atlantic Ocean; a founder of the *Edinburgh Review.*
**Smith-Bankhead Act,** U.S., **3656.**
**Smith College,** at Northampton, Mass.; women, non-sect.; founded by Sophia Smith (1796–1870); chartered 1871 (opened 1875); arts and science, art, music; Seelye Hall, *picture,* **2165.**
**Smithfield,** England, historic square in London, n. of St. Paul's; chief central cattle market; formerly place of public execution; old fair, **1219.**
**Smith-Hughes Law,** U.S., **3655, 3656, 3141.**
**Smith-Sears Act,** U.S., **3656.**
**Smithson, James** (1765?–1829). Eng. scientist, son of first Duke of Northumberland; founder of Smithsonian Institution, **3684.**
**Smithso'nian Institution,** Washington, D.C., **3684,** *picture,* **3682.**
**Smith'sonite,** zinc ore, **3839.**
**Smoke, 3253–4, 2611.**
**Smokeless powder, 1212, 1553.**
**Smoke screen,** in naval warfare, *picture,* **2424.**
**Smoky Mts.** Same as **Great Smoky Mts.**
**Smolensk** (*smō-lĕnsk'*). One of oldest Rus. cities, on Dnieper R., 270 mi. s.w. of Moscow; pop. 76,000; strategic position as key to Russia; taken by French (1812).
**Smol'lett, Tobias George** (1721–71), Brit. novelist, "founder of the satirical novel" ('Humphrey Clinker', in Thackeray's judgment, "most laughable story ever written"; 'Roderick Random', first Eng. sea novel), **1166.**
**Smolt,** a young salmon, **3113.**
**Smoot, Reed** (born 1862). Amer. politician and Mormon leader, b. Salt Lake City; U.S. senator since 1903; seat in Senate opposed because of Mormon affiliations and supposed encouragement of polygamy; chairman Republican senatorial campaign committee 1919.
**Smuts, Jan Christian** (born 1870), Brit. S. African soldier and statesman, **3254;** in Boer War, **447;** in World War, **3796;** plan for League of Nations, **1974;** quoted on Brit. Empire, **513–4.**
**Smuts,** various fungi parasitic upon plants, **3099–3101, 1382.**
**Smyrna** (*smēr'nȧ*), chief seaport of Asia Minor; pop. 350,000; **3255;** Gk. protectorate, **3626.**
**Smyrna fig, 1237,** *picture,* **1238.**
**Snails,** shelled gastropod mollusks, **3255–6, 2280;** in aquariums, **163;** eggs and egg baskets, *pictures,* **1090, 1091;** evolutionary position, *diagram,* **128;** eyes, *picture,* **1215;** length of life, **126;** shell, **3201, 3202,** *picture,* **3203.**
**Snake-bird.** *See in Index* **Darter.**
**Snake-charmers,** in India, **816–7,** *picture,* **1747.**
**Snake dance.** A ceremonial dance of the Hopi Indians in which the dancers carry live snakes in their hands and mouths.
**Snake fly,** tree-dwelling insect named for its long flexible "neck," found in Europe and Pacific coast states of U.S.; eggs, *picture,* **1091.**
**Snake Indians,** the Shoshonean group of N. Amer. Indians, also the Shoshone tribe; ranged chiefly in Rocky Mts.; **1767.**
**Snake River,** chief tributary of Columbia R.; rises in Yellowstone Park, flows through s. Idaho, then n. along w. boundary and w. to Columbia in s. Washington; length 1000 mi.; **1726–7, 2594;** Shoshone Falls, **1725,** *picture,* **1728.**

**Snakeroot.** A name given to various Amer. plants which are or were supposed to cure snake bites; black snakeroot (*Cimicipuga racemosa*), and Seneca snakeroot (*Polygala senega*) of the milkwort family are common in the U.S.; Canada snakeroot is the wild ginger.
**Snakes,** 3257–61, 2997, 3949; Australian, 269; boa constrictor, 440; cobra, 816–7; Congo snake a salamander, 3112; copperhead, 884; eggs, 1090; evolutionary position, *diagram*, 128; first aid for bites, 1269; glass snake a lizard, 2037, *picture*, 2036; hibernation, 1646; moccasin or cottonmouth, 2274; preyed upon by secretary bird, 3171; python, 2942; rattlesnakes, 2978; scales, 1680; teeth, 3452; tongue, 3513; vertebrate structure, 3634; vipers, 3646–7.
**Snapdragon.** A genus of plants found in N. Hemisphere; lower lip of large tubular corolla snaps shut if opened.
**Snapping bug,** a click-beetle, 369.
**Snapping turtle,** *picture*, 3563.
**Snare drum,** 1042, *picture*, 2382.
**Sneezing gas,** in warfare, 1408.
**Snipe,** a type of shore bird, 3261, 412, 2839; woodcock related, 3779.
**Snorri Sturluson** (*stur'lu-sŏn*) (1179–1241). Icelandic historian and official; author of 'Heimskringla' (sagas of Norwegian kings) and collector and editor of Younger or Prose Edda.
**Snout beetles** or **weevils,** 3713, 369; boll-weevil, *picture*, 904.
**Snow,** 3261–2; avalanche, 288; in cirrus clouds, 809; glaciers and ice-caps, 1465–6; red snow caused by algae, 2822; snowfall limit in N. Hemisphere, *picture-map*, 1414–5; winter sports, 3753–6.
**Snowball bush,** cultivated type of cranberry tree, 915.
**Snowberry,** ornamental shrub with clustered white berries; belongs to heath family, 915.
**Snow bird** or **bunting,** 534, *picture*, 411.
**'Snowbound',** poem by Whittier, 3736.
**Snowdon,** mt. in Wales, 3664.
**Snowdrop.** A small low plant with bulbous roots, narrow leaves, and scapes bearing single white drooping flowers; there are many cultivated varieties of the genus *Galanthus*, most of which bloom early in the spring and a few in the autumn.
**Snow grouse** or **ptarmigan,** 1544, 1545.
**Snow line,** 3261–2.
**Snowshoe,** 3753–4.
**Snow-shoe rabbit** or **varying hare,** 1584.
**Snowy owl,** 2607.
**Snuff,** tobacco prepared for inhaling, 3508, 3510; made from acacia, 4.
**Soane** (*sōn*), **Sir John** (1753–1837), Eng. architect; designed Bank of England; founded Soane Museum, 1200.
**Soap,** 3263–7; agave juice used, 42; chemical nature of, 10; formed during intestinal digestion, 1011; from sodium and potassium, 3271; olive oil, 2579; substitute from yucca root, 3835.
**Soap bubbles,** 3267–8; Newton studying, *picture*, 2477.
**Soap nut,** fruit of the tropical or subtropical soapberry tree; found chiefly in W. Indies but also in s. Florida; 2546.
**Soapstone** or **talc,** 3430.
**Sobieski** (*sō-bē-ĕs'kē*), **John** (1624–96), king of Poland (John III), elected 1674; freed Hungary, and became hero of Poland; defeats Turks, 3559, 2858; burial place, 914.
**Sobrero, Ascanio,** Ital. chemist, 1050.
**Soc'cer football,** 1326–7.
**'Social Contract, The',** by Rousseau, 3070–1.
**Social Democratic** or **Socialist party,** in U.S., 3268, 3269, 2870.
**Social insects:** ants, 139–45; bees, 359–63; wasps, 3690–3.
**Socialism,** 3268–9; Bolshevists, 450–1; 3095–6, 1986, 3544–5; coöperative societies, 879–80; economic principles, 1076–8; in France, 3268, 1347; in Germany, 3269, 1445, 3310; Karl Marx, 2156–7, 3268; More's 'Utopia', 2325–6; William Morris, 2329; Non-Partisan League, 2525; Tolstoy's doctrines, 3512.
**Socialist Labor party,** in U.S., 3268, 2870; in World War, 3269.
**Social sciences,** scope of term, 3270.
**Social settlements,** 3269; Hull House 16–18; Toynbee Hall, London, 16.
**Social War,** in anc. Rome, 3046.
**Societies, patriotic,** 2695.
**Societies, plant,** 473, 1076, 3700.
**Society.** *See in Index* **Sociology.**
**Society for Psychical Research,** 3327.
**Society Islands,** a group of 11 isls. in s. Pacific, nearly midway between Australia and S. Amer.; 637 sq. mi.; pop. 15,000; volcanic, mountainous (highest peak 7000 ft.), surrounded by coral reefs; 2621, 2624, *map*, 2624–5. *See also in Index* **Tahiti.**
**Society of Colonial Wars,** 2695.
**Society of Mayflower Descendants,** 2695.
**Society of the Cincinnati,** 2695.
**Society of the War of 1812,** 2695.
**Sociol'ogy,** study of human society, 3270, *Study Outline*, 3987–9; anarchism, 3269; cities, 769–70; eugenics, 1187; family and other social groups, 1223–4; immigration, 1738; personal names, 2388–9; population, 2880–1; prisons and punishments, 2918–20; slavery and serfdom, 3248–50; socialism, 3268–9; social psychology, 2931; social settlements, 3269; tattooing, 3440; temperance movement and prohibition, 3465, 2920–1; women's rights, 3777–9. *See also in Index* **Civilization; Economics; Education; Law; Superstitions.**
**Sock-eye salmon,** 3113.
**Socor'ro,** N.M., town in center, on Rio Grande; pop. 1256; supply center for mines to w.; 2467.
**Socotra** (*sō-kō'trä*) or **Sokotra,** an island under Brit. control off e. coast of Africa at entrance to Gulf of Aden; 1382 sq. mi.; pop. 12,000; dates, gums, live stock, butter, 1763, *maps*, 40–1.
**Socrates** (*sŏk'rà-tēz*) (about 469–399 B.C.), Gk. philosopher, 3270–1, 1538; Aristophanes ridicules, 1033, 1537; influence on Plato, 2832; Xenophon's 'Memorabilia', 3823.
**So'da,** 3271, 3272; action with sal ammoniac, 712; in baking, 305; California output, 582; caustic soda, 3271, 10; Leblanc mfg. process, 3272, 3390, 10; soda ash, 3271; Wyoming, 3818.
**Soda, baking,** sodium bicarbonate, 305.
**Soda pulp,** in paper-making, 2668.
**Soda water,** water charged with carbon dioxide, 3272, 642.
**So'dium,** a silver-white metallic element, 3271–2, 4042; comparative abundance, 711, *picture*, 1058, cyanide used in gold extraction, 944; in glass-making, 10; hydroxide used in soaps, 3263; Leblanc process developed, 10; phosphate used in making silks, 3238; in protoplasm, 394; in Rochelle salts, 3438; sulphate used in paper-making, 2668; tungstite used in fireproofing cloth, 1263; yellow light in spectrum, 3311, *picture*, 3313. —*Compounds:* biborate (borax), 3271, 464; bicarbonate (baking soda), 3271, 305, 1262, 3438; bromide, 2855; carbonate (soda), 3271, 10, 712, 3390; chloride (table salt), 3271, 3115, 10; cyanide, 944; hydroxide (caustic soda), 3271, 10; hyposulphite, 3271; nitrate (Chile saltpeter), 3118, 2510, *pictures*, 737, 2512; permanganate, 2135; sulphate, 3116, 2668; sulphide, 3116; thiosulphate ("hypo"), 3271, 3390.
**Sodium chloride.** *See in Index* **Salt; Sodium.**
**Sodium hyposulphite.** *See in Index* **Hyposulphite of sodium.**
**Sod'om, apple of,** various prickly or spiny weeds of the nightshade family; in U.S., 2509.
**Sodom and Gomorrah,** in biblical geography, cities in Palestine destroyed for wickedness, 3.
**Soeraba'ya,** Dutch E. Indies. *See in Index* **Surabaya.**
**Soest** (*zōst*), Germany. Prussian city 25 mi. e. of Dortmund, pop. 16,000; important Hansa town; early code of municipal laws, *jus susatense*, model for other free cities.
**Sofia** (*sō-fē'ä*), cap. of Bulgaria, almost in center of Balkan peninsula; pop. over 100,000; 3272, 532.
**Soft-shell clam,** 782–3.
**Soft-shell crab,** 914.
**Soft soap,** 3263, 3267.
**Soft water,** 3696.
**Sogne Fiord,** Norway, long, deep, narrow inlet of s.w. coast; rugged scenery; *map*, 2531.
**So'ho,** quarter in London, 2055.
**Soil,** 3272–3, 3864; acidity corrected by limestone, 2010; alluvial, 2791, 3023; in arid regions, 1830; bacteria as soil-makers, 302–3, 2511; buckwheat soil, 524; clay and loam, 784; effects of clover, 809; elements necessary for plant growth, 2824, *picture*, 2821; fertilizers, 1235, 2512, 3171; gardening, 1394; glacial deposits, 1466, 2571, 3768; how moisture travels, 641; irrigation and reclamation, 1827–30; legumes as soil-builders, 1235, 2511; lichens as soil-makers, 1994; loess, 749, 3750; mangroves build, 2135; mosses as soil-makers, 2340; nitrification by alfalfa, 89; nitrifying bacteria inoculations, 2512, 89; nitrogenous material obtained, 2511; silicon compounds, 3233; trees as soil-makers, 3532; volcanic, 679, 680, 1725, 3588; work of grasses, 1503; work of earthworms, 1066–8; work of roots, 3063; work of winds, 3750. *See in Index* **Alkali soils; Alluvial soil; Fertilizers.**
**Soissons** (*swä-sôn'*), historic town of n. France, 55 mi. n.e. of Paris on Aisne R.; pop. 15,000; fine 13th cent. cathedral shattered by Ger. shells 1918; scene of desperate fighting 1914–15 and 1918; French retake, 3806.
**Soissons, battle of** (486 A.D.), 810.
**Sokotra Islands.** *See in Index* **Socotra.**
**Solana'ceae.** Same as **Nightshade family.**
**Sola'num,** a genus of plants including common nightshades and potatoes, 2509, 2901.
**So'lar corona,** 1074.
**Solar engines,** 3392, 3394.
**Solar plex'us,** one of chief nerve centers, located behind stomach, 2437.
**Solar prominences,** 3395.
**Solar spectrum,** 3311, *picture*, 3313.
**Solar system,** 239–47, 3392–5; asteroids, 237; comets, 849–52; eclipses, 1074–5; earth, 1058–64; equinox and solstice, 1173; evolution of, 1209; gravitation, 1506–9, 2476–8; Kepler's laws of planetary motion, 1920–1; meteors and meteorites, 2202–4; movement through space toward Vega, 3342; origin, 2818–9, 1058, 1060; planets, 2815–9; sun, 3392–5.
**Solar time,** 3500; day, 969; month, 2317; year, 574.
**Solder** (*sŏd'ẽr*), composition of, 99, 1973.
**Soldier.** *See in Index* **Army.**
**Sole,** a flatfish, 1289–91.
**Sole,** of shoe, 3222, *picture*, 3223.

**Solenhofen** or **Solnhofen** (*zōln'hō-fĕn*), village of Bavaria 40 mi. s. of Nuremberg; lithographic stone, **2030.**
**"Sol-fa" singing, 2377.**
**Solferino** (*sōl-fā-rē'nō*), Ital. village 20 mi. n.w. of Mantua; Austrians defeated (1859), **1837, 2983.**
**Solid,** in geometry, **1425.**
**Solid measure, 3715.**
**Solingen** (*zō'ling-ĕn*), Germany, mfg. city in Westphalia; pop. 50,000; **1443.**
**Solis** (*sō-lēs'*), **Juan Diaz de** (1470?–1516), Span. navigator, **109, 192.**
**Solitaire** (*sŏl-i-tĕr'*), an extinct bird, **1017.**
**So'lo,** in music, **2584.**
**Sol'omon,** king of Israel (about 960 B.C.), **3274;** meaning of name, **2388;** Phoenician workmen, **2774.**
**Solomon, Temple of, 3274, 1885.**
**'Solomon, Wisdom of',** apocryphal book, **390.**
**Solomon Islands,** groups of volcanic isls. in Pacific 1000 mi. n.e. of Australia; 17,000 sq. mi.; pop. 200,000; **2620, 2624,** *maps,* **264–5, 2624–5.**
**"Solomon of England," 1635.**
**Solon** (*sō'lŏn*) (about 638–558 B.C.), Athenian reformer, law-giver, and poet, **3274–5;** and Croesus, **923;** vocational education, **3655.**
**Solo organ, 2600.**
**Solstice** (*sŏl'stĭs*), time when sun is nearest either Pole and farthest from the other, **1173,** *picture,* **1063;** Christmas festivals, **758.**
**Solu'tion,** in chemistry, **4040;** crystallization, **935;** broken up by electricity, **1125.**
**Solvay** (*sōl'vā*), **Ernest** (born 1838). Belgian industrial chemist, called "Belgian Carnegie" for his philanthropies; inventor of ammonia or Solvay process of making soda; paid huge indemnity to save Brussels from destruction by Germans.
**Solvay process, 3272.**
**Sol'way Firth,** inlet of Irish Sea, between England and Scotland, *map,* **1152–3.**
**Solway Moss,** place in England on Scotch border near Carlisle; battle (1542), **2158.**
**Sol'yman I, the Magnificent** (1494?–1566), greatest of the Ottoman sultans, **3559, 1703;** rebuilds walls of Jerusalem, **1885.**
**Somali** (*sō-mä'lē*), a people of Africa, **37.**
**Soma'liland,** e. peninsula of Africa between Gulf of Aden and Indian Ocean; comprises Ital. Somaliland, 139,430 sq. mi.; Somaliland Protectorate (Brit.), 68,000 sq. mi.; Fr. Somali Coast, 5790 sq. mi., and Abyssinian Somaliland, an undefined region extending inland from the other 3 territories; *map,* **40–1;** occupied by Italy, **40;** petroleum, **41.**
**Somers, Sir George** (1554–1611), Eng. navigator; settles Bermudas, **386.**
**Somers** or **Bermuda Islands, 386.**
**Som'erset, Edward Seymour, Duke of** (1506?–52), Protector of England in early part of Edward VI's reign, **1089.**
**Somerset Case, 3249.**
**Somerset** or **Victoria Nile, 2510.**
**Som'ersetshire.** County in s.w. England; 1630 sq. mi.; pop. 442,000.
**Somerville,** Mass., mfg. and residential suburb n.w. of Boston; pop. 93,091; **472.**
**Somme** (*sŏm*) **River,** in n. France, **3275, 1346;** touches Amiens and Saint-Quentin, **117, 3111;** World War battles, **3275, 3794, 3804, 3810.**
**Somnam'bulism, 3251.**
**Sonata** (*sō-nä'tà*), in music, **2378, 2379;** Beethoven develops, **366.**
**Song birds** or *Oscines* (*ŏs'i-nēz*), **419;** vocal organs, **405.**
**Song of Solomon.** Book of Old Testament, called also 'Song of Songs' and 'Canticles'; authorship formerly ascribed to Solomon.
**'Song of the Lark',** painting by Jules Breton, *picture,* **421.**
**Songs, 1316–8;** Civil War, **781, 2405;** national, **2404–5;** Grieg, **1542;** Schubert, **3143.**
**Song sparrow, 3308, 422.**
**Son'net,** poem of 14 lines with a definite rhyme scheme, **2851;** Petrarch's, **1833;** Shakespeare's, **3191.**
**'Sonnets from the Portuguese', 516.**
**Sonnino** (*sō-nē'nō*), **Sidney, Baron** (1847–1921). Ital. statesman and financier; minister of finance 1893–94, of Treasury 1894–96; premier 1906 and 1909–10; minister for foreign affairs 1914–19.
**Sonora** (*sō-nō'rà*), Mexico, state on Gulf of California bordering Arizona; 76,633 sq. mi.; pop. 275,000; cap. Hermosillo; coal, **2208, 2211.**
**Sonora coral snake, 3260.**
**Sonoran Desert,** Mexico, **3580.**
**Sons of Liberty,** organization in Amer. colonies opposed to policy of Brit. govt., **3337;** in New York, **2498.**
**Sons of the American Revolution, 2695.**
**Sons of the Revolution, 2695.**
**Sons of Veterans,** organization composed of male descendants of Union soldiers in Amer. Civil War, **2695.**
**"Soo"** or **Sault Sainte Marie Canal, 3129–30, 1513.**
**Soochow'** or **Suchow,** China. Wealthy silk-mfg. city on Grand Canal 55 mi. w. of Shanghai; founded 500 B.C.; pop. 500,000; almost destroyed by Taipings (1860).
**Sooping,** in curling, **940.**
**Soot,** in smoke, **3253.**
**Soothsayer,** one who claims to have supernatural foresight, **2120.**
**Sophia** (*sō-fī'à*) (1630–1714). Electress of Hanover, heiress of Eng. crown by Act of Settlement of 1701 (because nearest Protestant heir); mother of George I and ancestress of Hanover-Windsor line of Brit. sovereigns.
**Sophia,** Bulgaria. Same as **Sofia.**
**Sophia Dorothea** (1666–1726), wife of George I of England, **1428.**
**Sophists** (*sŏf'ists*), in anc. Greece, a class of teachers of rhetoric and practical philosophy; and Socrates, **3270.**
**Sophocles** (*sŏf'ō-klēz*) (496–406 B.C.), Gk. tragic dramatist, **1536, 1032;** chief works, **1038;** Oedipus trilogy, **2566.**
**Soprano** (*sō-prä'nō*) **voice,** highest range of, **3278.**
**So'ra rail,** a wading bird, **2961.**
**Sorata** (*sō-rä'tà*) or **Illampu** (*ēl-yäm'pų*), mt. peak in Bolivia, except Aconcagua highest in S. Amer., **123.**
**Sorbonne** (*sôr-bŏn'*), Paris institution of theology, science, and letters; founded in 13th cent.; incorporated in Univ. 1852; **832, 2684.**
**Sor'cery.** *See in Index* **Magic.**
**'Sordel'lo',** poem by Browning, **517.**
**Sore'dia,** of lichens, **1994.**
**Sorel',** Quebec. Port on St. Lawrence and Richelieu rivers 45 mi. n.e. of Montreal; pop. 9500; ships, wines, clothing, agricultural implements, foundry products.
**Sorghum** (*sôr'gŭm*), **3276;** broomcorn, **516;** kafir corn, **1907;** also called millet, **2239.**
**"Sorghum pop,"** a popcorn, *picture,* **539.**
**Sori** (*sō'rī*) (plural of "sorus"), spore cases of ferns, **3173.**
**Sorolla y Bastida** (*sō-rōl'yà ē bàstē'dà*), **Joaquin** (born 1863), Span. impressionist painter, leader of modern Span. artists; excels in marine compositions involving brilliant sunlight effects; **2633;** 'Hitching Oxen to the Boat', *picture,* **2632.**
**Soror'ities, 828.**
**Soro'sis,** women's club, **3777.**
**Sor'rel,** any plant of the genus *Oxalis;* **2607;** seed pods, **3171.**
**Sorrel tree.** Same as **Sourwood.**
**Sorrento** (*sŏr-rĕn'tō*). Ital. resort on Bay of Naples; pop. 7000; anc. Surrentum, famous for wine; birthplace of Tasso.
**Sosnowiec** (*sôs-nô-vē'ĕtz*), Poland. City in Upper Silesian coal field, 40 mi. n.w. of Cracow; pop. 119,000; textile center.
**Sothern** (*sŭth'ĕrn*), **Edward Askew** (1826–81). Eng. actor; made part of 'Lord Dundreary' famous; father of E. H. Sothern.
**Sothern, Edward Hugh** (born 1859), Amer. actor, b. New Orleans; in early years played romantic parts ('If I Were King'; 'The Three Musketeers'); later one of foremost Shakespearean actors (as Hamlet, Macbeth, Shylock, Petruchio); married (1911) Julia Marlowe; as 'Romeo', *picture,* **1037.**
**Souchong** (*sų-chŏng'*) **tea,** *picture,* **3446.**
**Soul,** Egyptian beliefs, **3155, 2369;** Greek, **1558;** transmigration, **1651, 525, 2941.**
**Soulé** (*sų-lā'*), **Pierre** (1802–70). Amer. political leader, b. France; U.S. senator from Louisiana 1847–53; as minister to Spain 1853–55 united with Buchanan and Mason in drawing up Ostend Manifesto.
**Soult** (*sųlt*), **Nicholas Jean de Dieu, Duke of Dalmatia** (1769–1851). Marshal of France; led decisive attack at Austerlitz; commanded in Spain against Sir John Moore and Wellington.
**Sound, 3276–8, 2786;** conveyed by water, **3233;** echo, **1073–4;** how the ear hears it, **1056–7;** phonopticon, **2003;** reproduced by phonograph, **2774–6;** speed, **1074;** transmitted by telephone, **3458,** *picture,* **3459;** voice, **3656–7;** ways of producing music, **2381.**
**Sound, The,** strait between Sweden and Zealand, **321, 994,** *map,* **997.**
**Sounder,** in telegraphy, **3456,** *picture,* **3457.**
**Soups,** how to make, **875–6.**
**Sour gum.** Same as **Black gum.**
**Sourwood** or **sorrel tree,** a tree of the heath family with clustered white flowers and acid-tasting leaves; classified, **3533.**
**Sousa** (*sų'zà*), **John Phillip** (born 1854). Amer. band-master and composer, b. Washington, D.C.; leader U.S. Marine Band 1880–92, thereafter Sousa's Band; during World War lieut. commanding Great Lakes naval band ('Washington Post'; 'Liberty Bell'; 'Stars and Stripes Forever'; 'El Capitan'; and numerous other marches).
**South, University of the.** Prot. Episc. institution at Sewanee, Tenn., founded 1857; men; arts and science.
**South Africa,** part of Africa (about 1,333,000 sq. mi.) lying s. of Zambezi R., **3279–83,** *maps,* **40–1, 3282;** agriculture and grazing, **3283, 2398, 2590;** animals, **3279, 146–7, 527;** climate, **3279, 641;** Cape of Good Hope, **640;** Cape Town, **640–1;** diamond mines, **1001,** *pictures,* **1002, 1003;** elevation, *map,* **40–1;** gold, **1479, 3526, 1895;** Johannesburg, **1895;** mineral resources, **3283, 3527;** metal, **2398;** natives, **3280, 36, 37,** *pictures,* **38, 3283;** Orange Free State, **2590;** ostrich farming, **2603;** physical features, **3279, 36;** population, **3283, 640–1,** *maps,* **40, 40–1;** railways, **3283, 41;** rainfall, *map,* **40–1;** vegetation, *map,* **40–1;** Victoria Falls, **3640–1;** Zambezi R., **3837.**
*History,* **3279–83;** struggle with Transvaal (1877–81), **3526, 3282;** work of Cecil Rhodes, **3011;** Boer War, **446–7, 3280–2, 3527;** Union of S. Africa formed, **3282–3, 475, 3254;** World War, **3796, 3283, 475, 3254.**
**South Africa, Union of,** a union of 4 Brit. colonies; 475,000 sq. mi.:

pop. 6,000,000; **3282–3**, *maps*. **40–1, 3282**; Botha, premier, **475**; mandate over Ger. Southwest Africa, **513**; leadership of Jan Smuts, **3254**. For further references *see in Index* **South Africa.**

**South America,** southern continent of New World; 7,700,000 sq. mi.; pop. 60,000,000; **3284–9**, *maps*, **3288–9, 110**; *Study Outline*, **3895–3899**; Amazon basin, **105–6, 3284**; climate, **3285, 122–3**; coast line and harbors, **3286, 1578**; coffee, **820–4**; commerce, **3286**; elevation, **2791**, *map*, **3288–9**; Incas, **1741**; influence of geography on history, **2514**; languages, **3307, 495**; Patagonia, **3692**; physical features, **3284, 3285, 122–3**; population, **3286–8, 2434**, *map*, **3288–9**; prehistoric race, **1078**; products and resources, **3284, 3285, 3286, 3289, 123**; rainfall, **2973**, *map*, **3288–9**; revolt of Span. colonies, **3289, 447–8, 836–7**; rubber, **3073–4**; transportation, **3286, 3288, 122–3, 2039**; U.S. relations, **2307, 2217, 3746**; vegetation, *map*, **3288–9.**

*Exploration and conquest*. **109–11**, *map*, **110**; Columbus, **849**; Vespucius, **3634**; Magellan, **2116**, *map*, **2115**; Sebastian Cabot, **562**; Pizarro's conquests, **2814**; Drake plunders Span. settlements, **1030**; Raleigh, **2975, 2976**. *See also in Index* **America** and chief physical features, cities, and countries by name.

**Southampton, Henry Wriothesley, 3d Earl of** (1573–1624), friend and patron of Shakespeare, **3191.**

**Southampton,** county in England. *See in Index* **Hampshire.**

**Southampton,** England, seaport 70 mi. s.w. of London; pop. 132,000; **3290.**

**Southampton,** isl. of Canada at n. outlet of Hudson Bay, *map*, **602–3.**

**South Australia,** state in s.-cent. Australia; 380,070 sq. mi.; pop. 470,000; Adelaide, cap. and chief port; agriculture and mining; *map*, **264–5.**

**South Bend,** Ind., farm center and industrial city in n., 75 mi. e. of Chicago; pop. 70,983; automobiles, plows, sewing machines, wagons, machinery; Univ. of Notre Dame near by; **1760**; La Salle at site of, **1762.**

**Southbridge,** Mass. Industrial town on Quinnebaugh R. 17 mi. s.w. of Worcester; pop. 14,245; optical supplies, shuttles, textiles, cutlery.

**South Carolina,** a s. Atlantic state; 31,000 sq. mi.; pop. 1,683,724; cap. Columbia; **3290–3**, *maps*. **3291, 3584–5**; chief cities, **3292, 699**; cotton, **3291, 904**; meaning of name, **3347**; palmetto, **2647**; physical features, **3290–1**; products and industries, **3291–2**, *pictures*, **3293.** —*History*, **3292, 1665, 699**; Huguenot colony, **826, 3292**; in Rev. War, **3004, 2149**; states' rights controversy, **575–6**; Jackson and nullification ordinance, **1857**; secedes from Union, **857, 777**; bombardment of Ft. Sumter, **1332–3.**

**South Carolina, University of,** at Columbia, S.C.; co-ed., non-sect.; opened 1805 (chartered 1801); arts and science, engineering, law, normal courses; *picture*, **3293.**

**South Dakota,** a n.-cent. state of U.S.; 77,615 sq. mi.; pop. 636,547; cap. Pierre; **3294–7**, *maps*. **3296, 3584–5**; artesian wells, **222**; "Bad Lands," **3296**; chief cities, **3296, 3297**; fossils, **1336**; Indians, **3296**; meaning of name, **3347**; referendum law, **1779**; state flower, **3347**; surface features, **3294, 3296.**

**South Dakota, University of,** at Vermilion, S.D.; co-ed., state control; founded 1883; arts and science, law, medicine, engineering, music; *picture*, **3295.**

**South Dakota State College of Agriculture and Mechanic Arts.** At Brookings, S.D.; co-ed.; founded 1883; pharmacy, agriculture, home economics, engineering, general science.

**Southdowns.** *See in Index* **Downs.**

**Southdown sheep, 3200,** *picture*, **3199.**

**Southend-on-Sea,** England. Watering place in Essex at mouth of Thames R.; pop. 88,000; bombarded by Germans in 1915.

**Southern California, University of.** At Los Angeles, Calif.; co-ed., Meth. Episc.; opened 1880 (founded 1879); liberal arts, medicine, dentistry, law, theology, pharmacy, music, oratory, fine arts.

**Southern Cross,** a constellation; location, *chart*, **3343**; not visible in N. Hemisphere, **3285.**

**Southern Educational Board,** U.S., **2435.**

**Southern Methodist University.** At Dallas, Tex.; co-ed.; opened 1915; liberal arts, medicine, pharmacy.

**Southern Pacific Railroad, 2963.**

**Southern Rhodesia.** *See in Index* **Rhodesia.**

**South'ey, Robert** (1774–1843), Eng. poet and prose writer, author of 'Battle of Blenheim', 'The Inchcape Rock', and 'How the Water Comes Down at Lodore' (ballads for children), and an incomparable 'Life of Nelson', as well as many ponderous epics; friendship with Coleridge, **825**; poet laureate, **2848**; quoted on child labor, **729.**

**South Georgia,** Brit. isl. in s. Atlantic 900 mi. s.e. of Falklands; 1000 sq. mi.; whaling station; **1223.**

**South Hadley,** Mass. Town on Connecticut R. 12 mi. n. of Springfield; pop. 5500; Mt. Holyoke College; paper, woolen, cotton mills.

**South Holland,** a province of the Netherlands, **1673.**

**South Island,** largest isl. of New Zealand; 58,120 sq. mi.; **2499, 2500.**

**South Magnetic Pole.** *See in Indcx* **Magnetic poles.**

**South Manchester,** Conn., town 9 mi. e. of Hartford; pop. 18,370; thread mfrs., **863.**

**South Mountain.** Range in w. Maryland; Union forces won passes at Crampton's and Turner's Gaps (Sept. 1862) just before battle of Antietam in Civil War.

**South Omaha,** Neb., since 1915 part of Omaha; meat-packing, **2430.**

**South Orkney Islands,** Brit. group in Antarctic Ocean 200 mi. e. of South Shetlands, **1223.**

**South Park,** Colo., fertile tableland near center of state surrounded by high mts.; 2000 sq. mi.; highest point Mt. Lincoln, 14,295 ft.; **840**, *map*, **841.**

**South Platte,** a r. rising in cent. Colorado and uniting with the N. Platte in Nebraska, *maps*, **840, 2429**; Denver on, **998.**

**South Pole,** the s. extremity of earth's axis; discovered by Amundsen, **2864**, *picture*, **120**; independent discovery by Scott, **3149.** *See also in Index* **Polar exploration.**

**Southport,** England. Watering place in Lancashire at mouth of Ribble Estuary; pop. 73,000.

**South River,** old name of Delaware R., **2487.**

**South St. Paul,** Minn., city 5 mi. from St. Paul; pop. 6860; stockyards, **2256.**

**South Sea Bubble.** Projects of South Sea Co. in England (1711–20) for assuming national debt in return for annual payments and monopoly of trade with S. Amer. and Pacific isls.; collapse ruined thousands.

**South Seas.** *See in Index* **Pacific Ocean.**

**South Shetland Islands,** chain of mountainous isls. belonging to Gt. Brit. on border of Antarctic region 500 mi. s.e. of Cape Horn, **1223**; sea elephant, **3169.**

**South Shields,** England. *See in Index* **Shields, South.**

**South Victoria Land,** Antarctica, vast ice-covered continental plateau s. of New Zealand and extending to South Pole, *maps*, **120, 144**; Ross claims for British, **2863.**

**Southwark** (*sŭth'ärk*), central metropolitan borough of London, England; pop. 184,000; 'Canterbury Tales', **701**; Globe Theater, *picture*, **3191**; Tabard Inn, *picture*, **705.**

**Southwest Africa Protectorate,** on w. coast of S. Africa (before World War, Ger. Southwest Africa); 322,400 sq. mi.; pop. 200,000 (16,000 whites); diamonds, copper; stock-raising; administered by Union of S. Africa; **3283**, *maps*, **3282, 40.**

**Southwestern College.** At Winfield, Kan.; co-ed., Meth. Episc.; founded 1885; liberal arts, music, business, art, oratory; teachers' certificates.

**Southwestern Presbyterian University.** At Clarksville, Tenn.; men; founded 1875; college, school of divinity.

**Southwestern University.** At Georgetown, Tex.; co-ed., Meth. Episc. South; founded 1873 by consolidation of 4 colleges; arts, science, music.

**Southworth, Emma Nevitte** (1819–99). Amer. novelist, b. Washington, D.C.; wrote many "best sellers" between 1850 and 1890 ('The Deserted Wife'; 'The Trail of the Serpent'; 'The Mother's Secret'; 'An Exile's Bride').

**Sovereign.** An Eng. gold coin worth £1 or $4.866.

**Soviet government,** in Russia, **3798, 3094, 3095–6**; Lenin, **1986**; Trotzky, **3544.**

**Soy bean, 3297**; oil, **1227, 2642**; yields improved celluloid, **673**; in Manchuria, **2135.**

**Soy sauce** or **shoyu, 3297.**

**Spa** (*spä*), Belgium. Watering place 16 mi. s.e. of Liége; pop. 8000; medicinal springs; Ger. general headquarters in World War and scene of William II's abdication; here Ger. delegates first met Supreme Council (1920).

**Space:** ether of, **1180**; immensity of universe, **242–7**; problem in metaphysics, **2772.**

**Spaghet'ti, 2093,** *picture*, **1839.**

**Spagnoletto** (*spä-nyō-lĕt'ō*), **Lo.** *See in Index* **Ribera.**

**Spain,** kingdom of s.w. Europe occupying most of Iberian peninsula; 190,050 sq. mi.; pop. 21,000,000; cap. Madrid; **3298–3306**, *maps*, **3300, 1196–7**; agriculture, **3301, 3302**; Balearic Isles, **307, 3301**; Canary Isls., **628**; chief cities and mfrs., **3301–2, 329–30, 2110–1, 3181–2, 3614–5**; climate, **3300, 3301, 3302**; education, **3302, 2111**; elevation, *map*, **1190–1**; government, **3306**; irrigation, **3302, 3614**; labor movement, **330, 1947**; leather, **1977**; lemon culture, **1985, 1986**; minerals, **3301, 3302, 1820, 2200, 2900, 3242**; olive-growing, **2580**, *picture*, **3302**; orange-growing, **2590**; people, **3301, 3302, 2323**; population, **3299**, *map*, **1190–1**; Pyrenees Mts., **2940**, *picture*, **3305**; rainfall, *map*, **1190–1**; surface features, **3299–3300**; vegetation, *map*, **1190–1.**

*History*. **3302–4**, *pictures*, **3301**; barbarian invasions, **3303, 3617, 1491**; Mohammedan conquest, **2278, 2323, 3303–4**; united under Ferdinand and Isabella, **3304, 1195, 1832**; Inquisition, **1780**; Ximenes regent, **3824**; under Charles V, **690–1**; Columbus discovers America, **846–9, 1832**; Magellan sails around the world, **2115–6**; New World explorations and conquests, **892, 894–5, 999, 2814**; power declines under Philip II, **2763, 2442, 3741**; war with England (1585–88), **210–1, 1137, 1031**; Philippines conquered, **2770**; Portugal independent, **2890**; War of the Spanish Succession (1701–13), **3304, 2763, 2066, 2150, 3612**; Gib-

raltar lost, **1458**; War of the Austrian Succession, **2147**; Seven Years' War, **3180, 2072, 1362**; war with England (1779–82), **3003, 1458**; Joseph Bonaparte king, **451, 2395**; Peninsular War (1808–14), **3304, 2396, 3717**; New World possessions lost, **3289, 448, 682, 2214**; insurrections in Cuba, **938**; war with U.S. (1898), **3306–7** (*see also in Index* **Spanish-American War**); under Alfonso XIII, **90**. *See also in Index* names of chief events and persons.

**RULERS OF SPAIN (FROM 1479)**

HOUSE OF ARAGON

1479-1504 Ferdinand and Isabella (Union of Castile and Aragon)
1504-16 Ferdinand, King of all Spain

HOUSE OF HAPSBURG

1516-56 Charles I
1556-98 Philip II
1598-1621 Philip III
1621-65 Philip IV
1665-1700 Charles II

HOUSE OF BOURBON

1700-46 Philip V
[1724 Luis I six months]
1746-59 Ferdinand VI
1759-88 Charles III
1788-1808 Charles IV
1808 Ferdinand VII

HOUSE OF BONAPARTE

1808-13 Joseph Bonaparte

BOURBON RESTORATION

1813-33 Ferdinand VII
1833-68 Isabella II
[1868-70 Provisional Government]

HOUSE OF SAVOY

1870-73 Amadeo I
[1873-74 Republic]

HOUSE OF BOURBON

1874-85 Alfonso XII
1885-86 Maria-de-la-Mercedes
1886- Alfonso XIII

**Spalato** (*spä-lä'tō*), Jugo-Slavia, Dalmatian port on Adriatic 75 mi. s.e. of Zara; pop. 32,000; exports wine and oil; **273**.

**Spandau** (*spän'dou*), Germany. Fortified suburb of Berlin; pop. 95,000; state munitions works; military school.

**Span'iel,** a long-haired, long-eared dog, **1022, 1023**.

**Spanish-American War** (1898), **3306–7, 2104, 938**; Dewey, **1000–1**; patriotic societies, **2695**; Roosevelt, **3060**; typhoid fever, **1312**; uniform, **3578**; U.S. territorial gains, **1545, 2770, 2887**; yellow fever, **2336**.

**Spanish Armada.** *See in Index* **Armada.**

**Spanish bayonet,** a yucca, **3835**.

**Spanish black, 888.**

**Spanish chestnut, 719.**

**Spanish-fly,** a blister-beetle, **370**.

**Spanish Guinea.** Same as **Rio Muni.**

**Spanish language, 3307**; number of people speaking, **2772**; origin, **3040**; in S. Amer., **3286**.

**Spanish literature, 3307–8**; Cervantes, **682–4**; drama, **1034, 1038**; Blasco Ibañez, **1719**; novel, **2539, 2541**.

**Spanish Main, 644, 835**; piracy, **2810**.

**Spanish moss,** an air plant, **69,** *picture,* **1299**; in Louisiana, **2068, 2070**.

**Spanish Netherlands.** Provinces in the Low Countries left to Spain after Holland secured her independence; ceded to Austria 1713; correspond in general to modern Belgium.

**Spanish onion, 2581.**

**Spanish Succession, War of** (1701–13), **2066, 2150**; results, **1156, 3304, 3612, 139, 2763**.

**Spark plug,** in gas engines, **1404,** *picture,* **280**.

**Sparks, Jared** (1789–1866). Amer. clergyman (Unitarian) and historian; professor of history at Harvard 1839–49, president 1849–53; edited writings of Franklin and Washington, with biographies.

**Sparrow,** a type of finch, **3308**; English, **426, 630,** *picture,* **418**; black throat of house sparrow, **410**; length of life, **126**; protective coloration, **2924**; seasonal migration, **2231**; song sparrow, *picture,* **418**; vesper sparrow's care of young, **408**; young, markings of, **412**.

**Sparrow hawk, 1606, 1607,** *picture,* **415**; skeleton, *picture,* **3245**.

**Spar'ta,** city-state of anc. Greece, **3308–10**; laws of Lycurgus, **2086**; at battle of Thermopylae, **2740**; becomes rival to Athens, **1522**; conquers Athens, **1524–5**; supremacy, **1525, 3310**; war with Thebes, **3485–6**.

**Sparta,** modern town, **3310**.

**Spartacans,** radical Ger. party, **3310, 1445, 2370**.

**Spartacus** (*spär'tà-kŭs*) (d. 71 B.C.), leader of slave revolt in Italy, **3310**.

**Spar'tanburg,** S.C., city in n.w., 16 mi. s. of boundary; pop. 22,638; iron works, lumber mills; Converse and Wofford colleges; cotton mfrs., **3292**.

**Spartiates** (*spär'tī-āts*), Spartan citizens, **3309**.

**Spat,** of oysters, **2612, 2614–5**.

**Spathe** (*spāth*), a leaf-like envelope protecting certain kinds of flower bud, **1305**.

**Spawn** (*spąn*), eggs of fishes, amphibians, mollusks, and other animals, especially in masses, **1090**; fishes, **1275, 3113**; frogs, **1373,** *picture,* **1374**; salamanders, **3112**; toads, **3507**.

**Spawn,** of fungi. Same as **Mycelium.**

**Speaker.** The presiding officer in various legislative assemblies. In U.S. Congress he is elected by members for one Congress and is leader of party in power; he is free to take part in proceedings (by calling another member to the chair) and by rulings wields tremendous political power. In Brit. House of Commons, the speaker is also elected, but upon taking chair loses all political identity; he may not take part in the debates and votes only in case of tie; because of nonpartisan character he is frequently reëlected in spite of change of party majority, and upon retirement customarily receives a peerage.

**Spearfish Canyon,** S.D., **3294**.

**Spearmint, 2257.**

**Spear thistle,** *picture,* **3489**.

**Special delivery,** of mail, **2893, 2894**; introduced in U.S., **2898**.

**Specie** (*spē'shĭ*) **circular,** Jackson's, **1857**.

**Specie payments, resumption of,** in U.S. (1879), **3606, 1611**; urged by Grant, **1499**.

**Species,** in biology, **412**.

**Specif'ic,** drug which cures a specific disease, **1042, 2192**.

**Specific density, 1508–9.**

**Specific gravity, 1509**; measured by hydrometer, **1711**; table of, **4042**.

**Specific heat, 1620**; in hydrogen, **3696**; in water, **3693, 3696**.

**Speckled trout, 3545.**

**Spectacled bear.** A small bear of the Andes Mts. (*Ursus ornatus*) with yellowish goggle-like rings about its eyes; it is thought by some scientists to be a subspecies of the Amer. black bear.

**Spectacled owl,** *picture,* **2606**.

**Spectacled snake.** Same as **Cobra.**

**Spectacles, 3310**; lenses, **1986–8**.

**'Spectator, The',** a daily periodical issued from March 1711 to December 1712, **1165, 1178**.

**Spectrohe'liograph, 2552.**

**Spectros'copy,** defined, **3312**.

**Spec'trum and spec'troscope, 3311–4**; in rainbows, **2972, 3343**; uses in astronomy, **240**; "X-ray spectra," **3826**.

**Spec'ulum,** of reflecting telescope, **3462, 3463**.

**Spee, Count Maximilian von** (1861–1914), Ger. admiral; victor at Coronel; went down with his ship *Scharnhorst* off Falkland Isls.; **1223**.

**Speech,** organs of, **3656–7**; method of teaching deaf-mutes, **970**.

**Speed,** in physics; of earth, **2063–4**; light, **1997–8**; radio waves, **3340**; solar system, **3342**; sound, **3277, 1997**.

**Speedom'eter,** automobile, **971.**

**'Speedwell',** Pilgrims' ship, **2176.**

**Speier,** Germany. Same as **Spires.**

**Speke** (*spēk*), **John Hanning** (1827–64), Eng. explorer, discoverer of the source of the Nile, **38, 3433, 3641**.

**Spelling, 3314–6**; formation of possessives and plurals, **2537**; reform, **3314**; rules, **3315–6**; scale for measuring ability, **3314–5**; Webster's influence, **3711–2**.

**Spells.** *See in Index* **Magic.**

**Spelter,** refined zinc ore, **3839**.

**Spelt wheat, 3732.**

**Spencer, Herbert** (1820–1903), Eng. philosopher; attempted to organize all knowledge into a system on scientific and especially evolutionary lines ('Synthetic Philosophy'; 'Data of Ethics'; 'Education'; 'Principles of Biology'; 'Social Statics'); **2247, 392, 1134, 1795**.

**Spenser, Edmund** (1552?–99), Eng. poet, among greatest Elizabethans and master of melodious verse; called by Charles Lamb the "poet's poet"; invented nine-line "Spenserian stanza"; **1164,** *pictures,* **1164, 2975**; quotation from, **194**; tomb, **3719**.

**Spense'rian stanza,** example quoted, **194.**

**Sperm,** of ferns, **1234**; moss, **2339**.

**Spermaceti** (*spēr-mà-sē'tī*), **3706, 3726.**

**Spermatophytes** (*spēr'mà-tō-fīts*), the group of seed-producing plants, **2831, 3173**; *Study Outline,* **3938–43**.

**Sperm oil, 3726**; displaced by kerosene, **2749**.

**Sperm whale, 3726**; commercial "ivory," **1853**.

**Sperry, Elmer Ambrose** (born 1860), Amer. electrical engineer and inventor, b. Cortland, N.Y.; holds over 400 patents; perfects gyrocompass, **1555**.

**Speyer** (*spī'ĕr*), Germany. Same as **Spires.**

**Sphagnum** (*sfăg'nŭm*) **moss, 2340**; in peat bogs, **2704**; moors, **3700**.

**Sphecoidea** (*sfē-koi'dē-à*), the superfamily of mud-dauber wasps, **3693**.

**Sphe'nodon** or **tuate'ra,** a reptile, **2038, 2997.**

**Sphere** (*sfēr*), **1425, 1422.**

**Spher'ical aberration, 3462, 2228.**

**Sphinx** (*sfinks*), Egyptian, **3316–7,** *pictures,* **2940, 1103, 3155**; the Great Sphinx, **1100**; Oedipus answers riddle, **2566, 3019**.

**Sphinxes, Avenue of,** Karnak, *picture,* **1103.**

**Sphinx moth, 548.**

**Spi'ca,** a star in the constellation Virgo, **3342**.

**Spice-berry** or **wintergreen, 3752.**

**Spice Islands.** *See in Index* **Moluccas.**

**Spices and condiments, 3317–9**; cloves, **810**; ginger, **1460**; trade in, **3317, 1072, 2131**; mustard, **2385**; nutmeg and mace, **2544–5**; pepper, **2723–4**.

**Spicules** (*spĭk'yųlz*), of sponges *pictures,* **3328**.

**Spider-beetle, 370.**

**Spider crab, 912,** *picture,* **913.**

**Spider monkey,** *picture,* **2290.**

**Spiders, 3320–6, 3946**; Bruce and the spider, **518**; egg-laying habits, **1090**; evolutionary position, *diagram,* **128**; eyes, *picture,* **1215**; foot, *picture,* **1323**; mythical origin, **249**; tarantulas, **3436–7**; thread used in optical instruments, **2227, 2551**.

**Spider silk, 3325.**

**Spiderwort,** a trailing plant, **3669.**

**Spiegeleisen** (*spē'gĕl-ī-zĕn*), a cast iron containing manganese, **2135**.

**Spike'nard** or **nard.** A costly perfume produced from a plant native to the mts. of n. India; used by the ancients in baths and at feasts; the ointment of spikenard mentioned in the Bible was probably an oil or fat scented with the perfume; in the U.S. an herb (*Aralia racemosa*) with large spicy aromatic roots is called spikenard.
**Spillway,** of dams, *pictures,* **1829, 2486, 2658.**
**Spin'ach,** a fleshy-leaved herb of the goosefoot family; contains vitamins, **3652;** when and how to plant, **1397.**
**Spi'nal cord,** the nerve trunk in the spine; in man, **486;** structure, *pictures,* **2437.**
**Spinal nerves, 2437.**
**Spindle, 3326, 3327.**
**Spine,** the vertebrate "backbone," **3245;** characteristic feature of vertebrates, **3634;** evolution seen in fishes, **1277;** modified in birds, **400;** in snakes, **3257;** spinal cord, **486,** *pictures,* **2437.**
**Spines,** stiff pointed projections; in fins of fish, **1277;** of sea-urchin, **3345;** in sponges, **3329,** *pictures,* **3328.**
**Spin'et,** forerunner of piano, **2797.**
**Spin'neret,** of silkworm, **3237;** of spider, **3326,** *pictures,* **3323.**
**Spinning and weaving, 3326–7;** Arkwright's spinning frame, **210;** Cartwright's power-loom, **652;** cotton, **902–4;** Crompton's "spinning mule," **923–4;** first power-loom in U.S., **2168;** Hargreaves' jenny, **208, 210;** Jacquard loom, **3327, 3080, 1937, 1949,** *pictures,* **3239, 1951–3;** kinds of fabrics, **804;** lace, **1949–53;** linen, **2018;** Navajo blankets, **205–7;** primitive methods, *pictures,* **206, 212, 1944, 3077, 3079;** rugs and carpets, **3077–80;** silk, **3236–40;** Slater founds industry in U.S., **3007;** thread, **3493;** tapestry, **3434;** wool, **3782–7.**
**Spinning frame, 210.**
**Spinning glands,** of spider, *picture,* **3323.**
**Spinning jenny,** invented by Hargreaves, **1589;** improved by Crompton, **924.**
**Spinning mule, 924.**
**Spinning wheel, 3327,** *pictures,* **212, 1944.**
**Spinoza** (*spĭ-nō'zȧ*), **Baruch** or **Benedict** (1632–77). Dutch (Jewish) philosopher, called by Novalis the "God-intoxicated man"; belonged to no school and founded none, yet influenced poets and thinkers like Goethe, Lessing, Wordsworth.
**Spinthar'iscope,** for detecting radioactivity, *picture,* **2958.**
**"Spin the Platter,"** game, **2836.**
**Spiny ant-eater,** an egg-laying mammal of Australia, **1047,** *picture,* **266.**
**Spir'acle,** breathing orifice of an insect, **1787;** of silkworm, *picture,* **2998.**
**Spi'ral flowers, 3939.**
**Spiral nebulae, 2432.**
**Spire'a** or **spiraea,** various flowering shrubs, **3327;** in hedges, **1628.**
**Spires** (Ger. **Speyer** or **Speier**), town in Bavaria, on Rhine; pop. 24,000; Romanesque cathedral begun 1030; bishopric one of oldest in Germany; **3006;** Diet of (1529), **2988.**
**Spires,** in architecture, **188.**
**Spiril'la** (plural of *spirillum*), corkscrew-shaped bacteria, **303, 1450,** *picture,* **1452.**
**Spir'itualism, 3327.**
**Spirogy'ra,** a genus of green algae, **92, 3937.**
**Spitzbergen** (*spĭts'bĕr-gĕn*), group of isls. on Arctic Ocean, 500 mi. n. of Norway; 25,000 sq. mi.; **2534, 189, 190,** *map,* **189;** whaling, *pictures,* **3724, 3725.**
**Spitz dog, 1023.**
**Spitz'kop,** mt. in Province of Cape of Good Hope, S. Africa; battle in Boer War, **447.**
**Spleen,** a bean-shaped, pulpy organ to the left of the stomach; functions still obscure; produces white corpuscles, **437.**
**Spleenworts,** various small ferns, **1232.**
**Splices, 1940–1.**
**Splinters,** how to remove, **1270.**
**Spof'ford, Harriet Prescott** (1835–1921). Prolific Amer. novelist and short-story writer, b. Calais, Me. ('The Amber Gods'; 'The Thief in the Night'; 'Sir Rohan's Ghost'; 'The Marquis of Carabas').
**Spohr** (*spōr*), **Louis** (1784–1859). Ger. composer and violinist; wrote 200 works, including operas, oratorios, symphonies, chamber music; 'The Violin School' is still a standard of instruction.
**Spoils system, 776;** and Jefferson, **1883;** Jackson applies, **1856;** Van Buren continues, **3616;** civil service reform, **1611, 222–3, 3059.**
**Spokane** (*spō-kăn'*), 2d city of Washington on Spokane R. near Idaho border; pop. 104,437; **3328.**
**Spokane River,** the outlet of Coeur d'Alene L.; flows w. 120 mi. to Columbia R.; **3328,** *map,* **3687.**
**Spoleto** (*spō-lā'tō*). Ital. town, 60 mi. n.e. of Rome; pop. 9000; Rom. ruins; medieval cathedral; French besieged by Italians 1860.
**Spon'dee,** metrical foot, **2851.**
**Sponge coral,** *picture,* **885.**
**Sponges,** a division of primitive animals or their skeletons, **3328–30, 3944;** Bahamas, **305;** bodies make flint, *picture,* **1335;** boring type, *picture,* **2614;** evolutionary position, **128;** Florida fisheries, **1297–8;** Mediterranean, **2194, 3230.**
**Sponges, vegetable, 1492.**
**Spon'gin,** fibrous stiffening matter in sponges, **3944.**
**Spon'son canoes, 442.**
**Spontaneous combustion, 1249;** sometimes caused by bacteria, **303.**
**Spontaneous generation,** doctrine that living forms sometimes arise from inorganic matter; theory discredited, **398.**
**Spools,** for thread, **3493;** mfrs. in Maine, **2126.**
**Spoon,** a golf club, *picture,* **1486.**
**Spoon,** utensil, **1937.**
**Spoonbill,** an ibis-like bird with flat bill, **3364, 412.**
**Spoonbill duck** or **shoveler, 1044,** *picture,* **1045.**
**Sporades** (*spŏr'ȧ-dēz*) **Islands,** group in Aegean Sea off coast of Asia Minor; *map,* **1518.**
**Sporan'gia** (plural of *sporangium*), spore-bearing organs of lower plants, **3173;** in algae, **92;** in ferns, *pictures,* **1234;** in mosses, **2339.**
**Spores,** of plant, **3173;** of algae, **92;** in bacteria, **303;** ferns, **1232, 1234;** liverwort, **2032;** moss, **2339;** mushrooms, **2374;** rust or smut, **3099,** *pictures,* **3100.**
**Spo'rophyte,** a plant or plant structure which reproduces by unfertilized spores; in ferns, **1234;** moss, **2339.**
**Sporozo'a,** class of unicellular animals parasitic upon higher animals, **3944.**
**Sport,** in biology, a young organism markedly unlike its parents; in mutation theory of evolution, **1210–1;** used in plant breeding, **539.**
**Sports and games:** bicycling, **391;** billiards, **392–3;** boating, **441–6;** bowling, **475–6;** charades, **687–8;** checkers, **707–8;** chess, **716–8;** children's games, **2832–3, 1872, 3186;** croquet, **926;** falconry, **1220;** fencing, **1231–2;** kite-flying, **1930–2;** roque, **926;** sailing, **444–5;** winter sports, **3753–6.** *See also in Index* **Athletics.**
**Spotswood** or **Spottswood, Alexander** (1676–1740). Amer. colonial gov., of Scotch descent, b. Tangier, Africa; lieut.-gov. of Virginia 1710–22; deputy postmaster-general of colonies 1730–39; developed Virginia iron industry and aided education; large land-owner.
**Spotted salamander, 3112,** *picture,* **3112.**
**Spotted Tail,** Sioux Indian chief, **3296.**
**Spotted turtle,** *picture,* **3562.**
**Spottsylva'nia Court House,** village 45 mi. n. of Richmond, Va.; named for Alexander Spotswood; battles in Civil War, **779, 1984, 1571.**
**Sprague** (*sprāg*), **Frank Julian** (born 1857), Amer. inventor and engineer, b. Milford, Conn.; builds early electric street railway, **3371.**
**Sprat.** A small herring (*Harengula sprattus*) 6 in. long, abundant in the n. Atlantic off the European coast; dry-salted or cured in brine it forms a good and inexpensive food; the true sprat is not found in Amer. but certain small species have been given the name.
**Spraying, 3330–1;** copper compounds, **881.**
**Spraying tools,** pneumatic appliances, **2847.**
**Spree** (*sprā*) **River,** Prussia, rises in Saxony near Bohemian border, flows n.w. 227 mi., joining Havel at Spandau; connected by canals with Oder and Spandau; **385.**
**Spreewald** (*shprā'vält*), Germany, low marshy dist. dotted with lakes and canals in Spree R. valley, about 50 mi. s.e. of Berlin; about 106 sq. mi.; postman, *picture,* **2892.**
**Spring,** season, cause of, *picture,* **1063;** Demeter myth, **991–3;** Gk. festivals, **1032;** nature study, **2413–4;** Scandinavian legend, **3135–6;** vernal equinox, **1173.**
**Spring,** in clocks and watches, **803.**
**Spring,** of water, **3331;** artesian wells, **221–2;** geysers, **1454–6.** *See also in Index* **Mineral springs.**
**Spring** or **shear steel, 1824.**
**Springbok** or **springbuck,** an African antelope, **146.**
**Springfield,** Ill., state cap. near center on Sangamon R.; pop. 59,183; **3331–2, 1736;** capitol, *picture,* **1734;** Lincoln, **2012, 2014.**
**Springfield,** Mass., important industrial center of New England; pop. 129,614; **3332, 2165.**
**Springfield,** Mo. Mfg. city in mineral belt of s.w. Missouri; pop. 39,631; stock-raising, farming, and lumbering interests; carriages, wagons, iron and lumber products; Drury College; scene of several Civil War battles.
**Springfield,** Ohio. Industrial and r.r. city 45 mi. w. of Columbus on Mad R.; pop. 60,840; makes machinery, foundry products, etc.; printing and floral industries; Wittenberg College (Luth.).
**'Springfield Republican',** newspaper, **3332.**
**Springfield rifle, 1254, 1256,** *picture,* **1253.**
**Spring tail,** small insect which leaps by using its tail as a spring; classified among primitive types, **3946.**
**Spring tide, 3497.**
**Spring wheat, 3730,** *picture,* **3731;** N. Dakota yield, **2524.**
**Spruce,** a type of conifer tree, **3332–3;** in Alaska, **74;** amount cut in U.S., **3590;** distinguished from other conifers, **3539;** in swamps, **3700;** used in airplanes, **66, 2076.**
**Spruce Knob** or **Mountain,** peak of Alleghenies in W. Virginia, **3720.**
**Spun glass, 1472.**
**Spun silk, 3240.**
**Spurge** (*spûrj*) **family** or *Euphorbiaceae,* family of plants of the geranium order, **3942.**
**Spurgeon** (*spûr'jŏn*), **Charles Haddon** (1834–92). Eng. Nonconformist preacher, whose London congregation built Metropolitan Tabernacle and filled its 6000 seats; his forceful sermons, translated into many languages, had wide circulation.

**Spurges,** various herbs with resinous, milky juice; poisonous properties, **2852.**
**"Spurlos versenkt," 3791.**
**'Spy, The',** novel by James Fenimore Cooper, **878.**
**Spyglass,** a hand telescope with reversing lens, **3463.**
**Squab,** a young pigeon, **2804.**
**Squama'ta,** order of reptiles, **2038.**
**Squan'to** or **Tisquantum,** Indian friend of Plymouth settlers, **2841, 3338,** *picture,* **2177.**
**Square,** in geometry, **1425.**
**Square,** a unit of measure, **3715.**
**Square knot, 1938.**
**Square rig,** of ship, **3209.**
**Squash,** a vegetable of the gourd family, **3333, 1492;** when and how to plant, **1397.**
**Squatter sovereignty.** Same as **Popular sovereignty.**
**Squeers.** In Dickens' 'Nicholas Nickleby', brutal, ignorant schoolmaster who flogged and starved pupils at Dotheboys Hall.
**Squid,** a ten-armed finned mollusk, **942, 3333, 3945,** *pictures,* **941, 943;** classified, **2280;** evolutionary position, **128;** might be the traditional "sea serpent," **3169;** secretes sepia, **1779–80.**
**Squire,** knight's attendant, **1933–4.**
**Squirrel, 3333–7,** *pictures,* **2414, 2415;** classified, **3036;** distinguished from marmots and ground squirrels, **2912;** foot, *picture,* **1323;** fur, **1390;** length of life, **126;** migrations, **2234;** story, 'Mr. Fluffy Tail and Miss Curly Locks', **3335–7.**
**Squirrel monkey, 2290.**
**Srinagar** (*srē-nŭg'ər*), India, cap. of state of Cashmere in n. on Jhelam R. in famous Vale of Cashmere; pop. 127,000; makes paper, papier mâché, silver and copper ware, leather; **652, 653.**
**Stabilizing devices, 1555.**
**Stable fly,** a blood-sucking fly, frequenting stables and often entering houses; egg, *picture,* **1091.**
**Stadacona** (*stä-dăk'ō-nà*), Canada, village near Quebec; Cartier camps at, **651, 652.**
**Sta'den,** part of Stockholm, **3358.**
**Stad'holder,** former title of chief magistrate of the Netherlands, **2442.**
**Stadium** (*stā'dĭ-ŭm*), Gk. measure of length (equal to about 606 Eng. feet); term applied to race-course at Olympia, which was exactly a stadium in length, and later to similar places for holding athletic contests; at Athens, **249;** at Olympia, **2580;** Harvard, **829;** Yale "Bowl," *picture,* **830.**
**Staedal Art Institute,** Sachsenhausen, Germany, **1357.**
**Staël** (*stä'ĕl*), **Madame de** (Anne Louise Germaine Necker, Baronne de Staël-Holstein) (1766–1817), Fr. novelist, daughter of financier Necker; enjoyed enormous reputation in her day; banished by Napoleon; chief works, **1365.**
**Staff,** in army. *See in Index* **General Staff; General Staff Corps.**
**Staff,** in music, **2377,** *picture,* **2376.**
**Staf'fa,** tiny isl. of Scotland off w. coast, 7 mi. from Mull; Fingal's cave, *picture,* **3148.**
**"Staff of life," 496.**
**Stafford, Henry, Duke of Buckingham** (1454?–83), **3017.**
**Stafford, William Howard, Viscount** (1614–80). Eng. Royalist, executed on charge of complicity in the "Popish plot" of Titus Oates.
**Staffordshire,** England, midland county; 1171 sq. mi.; pop. 1,350,000; coal, iron, clay deposits; iron and steel mfr.; pottery, **1158.**
**Stag, 979,** *pictures,* **980, 981.**
**Stag beetle, 371;** foot and claw, *picture,* **1784;** mandibles, *picture,* **1782;** method of defense, **1785.**
**Stage,** of theater, **3482, 3484,** *picture,* **3483.**
**Stagecoach,** introduced in England, **3023;** in U.S., **3526.**
**Staggerweed,** or dwarf larkspur, **1963.**
**Staghorn sumach, 3390–1.**
**Stagira** (*stä-jī'rà*). In anc. geography, town on coast of Chalcidice, Macedonia; birthplace of Aristotle, called from it "The Stagirite."
**Stag's horn coral,** *picture,* **885.**
**Stained glass, 1474;** in Gothic cathedrals, **184.**
**Stains,** wood dyes, **2643.**
**Staked Plain.** *See in Index* **Llano Estacado.**
**Stalactites** (*stà-lăk'tīts*) and **stalagmites** (*stà-lăg'mīts*), **664–5, 571.**
**Stale'mate,** in chess, **718.**
**'Stalky and Co.',** story by Kipling, **1926.**
**"Stalwart" Republicans, 1398, 1399, 1499, 222.**
**Stamboul** (*stăm-bụl'*), Mohammedan quarter of Constantinople, **871.**
**Sta'men,** the pollen-producing organ of plants, **1304, 1306.**
**Stamford,** Conn. Residential and industrial city and port on Long Island Sound and Mill R., 30 mi. n.e. of New York; pop. 35,096; hardware, locks, typewriters, woolen goods.
**Stamford Bridge.** Place in England about 8 mi. n.e. of York where Harold II defeated Norse invaders (Sept. 1066).
**Stamp,** postage and revenue, **3337;** War Savings and Thrift, **3802.** *See also in Index* **Postage stamps.**
**Stamp Act** (1765), **3337–8, 3001;** denounced by Patrick Henry, **1637–8;** Franklin secures repeal, **1358;** Pitt opposes, **700.**
**Stamp Act Congress,** at New York City (1765), **3337, 2604.**
**Stamp duties, 3337.**
**Stamp mill, 2250.**
**Standard gauge,** of railroads, **2965.**
**Standardized construction,** of automobiles, **277;** of Liberty motors, **60;** of ships, **3216.**
**Standardized tests.** *See in Index* **Measurements and tests.**
**Standard kilogram,** *picture,* **3714.**
**Standard meter,** *picture,* **3714.**
**Standard Oil Company, 3034;** Bayonne pipe-line terminal, *picture,* **2753;** control of pipe lines, **2754;** forms first business trust, **3545.**
**Standards, Bureau of,** U.S., **3599.**
**Standard time, 3500–1;** time zones, *pictures,* **3501, 3502.**
**Standard weights and measures, 3713–4.**
**Standish, Miles** (1584?–1656), Eng. soldier, military leader of Plymouth colonists, **3338, 2841;** house at Duxbury, *picture,* **2842;** wife of Miles Standish, **3338.**
**Stanford, Leland** (1824–93), Amer. capitalist and philanthropist, founder of Leland Stanford Jr. Univ., **581.**
**Stan'islaus, Saint** (1030–79), bishop of Cracow and patron saint of Poland, slain before the altar by King Boleslaus; burial place, **914.**
**Stanley, Sir Henry Morton** (1841–1904), African explorer, **3338–9, 2035;** explores Congo basin, **38, 859;** explores Victoria Nyanza, **3641.**
**Stanley,** cap. of Falkland Isls.; pop. 950; **1223.**
**Stanley Falls,** cataract in Congo R., **859.**
**Stanley Pool,** expansion of Congo R. above Leopoldville, **859.**
**Stanleyville.** Trading and administrative station of Congo State on Congo R. at Stanley Falls; r.r. around falls.
**Stanovoi** (*stä-nō-voi'*) **Mts.,** Siberia. Range running 2400 mi. n.e. from Mongolia to Bering Strait; 3000 to 5000 feet; s. portion heavily forested.
**Stanton, Edwin McMasters** (1814–69), sec. of war in Lincoln's and Johnson's administrations, **3339–40,** *picture,* **2015;** removed by Johnson, **1898.**
**Stanton, Elizabeth Cady** (1815–1902), Amer. reformer, pres. of National Woman Suffrage Association (1865–93), **3778;** friendship with Susan B. Anthony, **149.**
**Stanwix, Fort,** colonial military post built 1758 on Mohawk R. defending portage to Oneida L.; first Amer. flag, *picture,* **1287.**
**Star,** in astronomy, **3340–4, 240–7;** constellations, **872,** *picture,* **873;** nebulae, **2432–3;** planets not stars, **2815;** "shooting stars," **2202, 240;** spectroscopic study, **3311–2,** *picture,* **3313.** *See also in Index* **Astronomy.**
**Star apple,** a West Indian fruit, **1378.**
**Starboard,** origin of term, **3208.**
**Starch, 3344;** animal (glycogen), **2031;** arrowroot, **220;** changed into glucose, **1475;** from corn, **890;** food value, **1320, 1321, 1322;** formed by leaves, **1980;** how digested, **1010, 1011;** in potatoes, **2901;** in rice, **3015;** in sago, **3104;** in wheat flour, **1302;** why used in baking powders, **305.**
**Star Chamber,** former Eng. court, **3344, 1635.**
**Starfish,** an echinoderm animal, **3344–5, 3165;** attacks oysters, **2614;** evolutionary position, *diagram,* **128;** related to sea-urchin, **3170.**
**Stark, John** (1728–1822). Amer. Rev. general; fought at Bunker Hill, Trenton, and Princeton; won victory at Bennington, Vt., Aug. 16, 1777; later commander of Northern Dept.
**Starling, 3345–6, 412,** *picture,* **417.**
**Starnberger See** (*shtärn'bêrĸ-ēr zā*). Picturesque small lake of upper Bavaria, 15 mi. s.w. of Munich.
**Star of Bethlehem.** A genus of plants of the lily family, native to the E. Hemisphere, named from their star-shaped flowers; the hardy common star of Bethlehem (*Ornithogalum umbellatum*), which has been cultivated and has escaped from gardens in the U.S., has racemes of from 6 to 9 large white fragrant flowers which close late in the afternoon.
**Star of India, Order of, 979.**
**Star of South Africa,** famous diamond, **1005.**
**Star of the South,** famous diamond, **1005.**
**Star shells,** fireworks, used in World War, **1266.**
**'Star Spangled Banner',** Amer. national song, **2405.**
**Star-stone,** hard alloy used in high-speed tools, **99.**
**Starved Rock,** historic bluff on Illinois R., **1730–1, 726,** *picture,* **1732.**
**Stassfurt** (*shtäs'furt*), Germany, town 20 mi. s. of Magdeburg; pop. 17,000; salt works and famous potash deposits, **2898, 2900, 1235.**
**State, Department of,** U.S., **3596, 3597, 3598, 555;** consular and diplomatic service, **872, 1013, 3596;** passports, **2691–2.**
**State, Papal Secretary of, 2666.**
**State banks,** in U.S., **328.**
**State flowers, 3347.**
**State governments, 3346–7;** bill of rights, **393;** control over cities, **770;** courts, **909;** education, **1086, 830, 3142;** health department, **1612–5;** impeachment, **1741;** initiative, referendum, and recall, **1779;** laws subject to judgment of U.S. Supreme Court, **3594;** powers, **3593;** public utilities, **2932;** states' rights theory, **3347–8;** suffrage, **3384–5;** taxation, **3441–2.**
**State House,** Boston, **469.**
**State House** (old), Boston, **472,** *picture,* **471.**
**Stat'en Island,** N.Y., at entrance to New York bay, **2488, 2498.**
**States,** of U.S.: area, population, and dates of admission, *table,* **3587;** nicknames, flowers, and meaning

and origin of names, *table,* **3347.** *See also in Index* **State governments.**
**States-General,** name of Dutch parliament, **1179, 2442.**
**States-General,** France. *See in Index* **Estates-General.**
**States of the Church.** *See in Index* **Papal States.**
**States' Rights,** in U.S. history, **3347–8, 2870;** Calhoun's views, **575–6;** contributing cause of Civil War, **776;** reserved in federal Constitution, **3593;** A. H. Stephens, **3353;** Virginia and Kentucky Resolutions, **3604, 14;** Webster's views, **3710.** *See also in Index* **Nullification; Secession.**
**State Street,** Chicago, *pictures,* **722.**
**Stat'ic electricity, 1108, 1110–2;** generated by friction, *picture,* **1111.**
**Statics,** a branch of mechanics, **2189.**
**Statis'tics,** gathered by U.S. census, **676–8.**
**Statue of Liberty,** N.Y., **2487,** *picture,* **2488.**
**Sta'tus quo, 213.**
**Stat'ute law,** defined, **1972.**
**Staubbach** (*shtoub'bäĸ*), waterfall in Switzerland, s. of Lauterbrunnen; height 980 ft.; *picture,* **3414.**
**Staun'ton,** Va. City 100 mi. n.w. of Richmond; pop. 10,623; chemicals, bricks, pennants, organs, machine-shop and foundry products; occupied by Union troops in 1864; several preparatory schools; birthplace of Woodrow Wilson.
**Staunton River,** upper Roanoke R. before junction with Dan R., *map,* **3650.**
**Stavanger** (*stä'väng-ĕr*), seaport on s.w. coast of Norway; pop. 46,000; textiles, soap, preserves, iron products, fisheries; **2532.**
**Stavropol** (*stäv'rō-pōl*), trading and agricultural center in s. Russia, 275 mi. n. of Tiflis; pop. 65,000; **664.**
**Stead** (*stĕd*), **Robert James Campbell** (born 1880), Canadian author, **624.**
**Stead, William Thomas** (1849–1912). Eng. journalist and reformer; a vigorous opponent of social evils, advocate of international peace, leader in psychic research; drowned in wreck of *Titanic* ('If Christ Came to Chicago').
**Steam,** water vapor, **3350;** latent heat of, **3696.**
**Steam engine, 3348–52;** governor, **3352, 682;** importance to civilization, **774, 1778, 3514, 3526;** locomotive, **2043–4;** Newcomen's, *picture,* **3705;** Stephenson, **3353, 2044;** turbines, **3553–4;** Watt invents, **3705;** Watt's perfected model, *picture,* **3704.**
**Steam-hammer, 1826.**
**Steam heating, 1622.**
**Steamships, 3210–8;** Fulton, **1381;** importance in modern life, **3526;** naval warfare revolutionized, **2428;** turbines, **3553–4.** *See also in Index* **Ships.**
**Steam shovels, 1041,** *picture,* **1040.**
**Steam turbine, 3553–4.**
**Steapsin** (*stē-ăp'sĭn*), an enzyme, **1010.**
**Stearic** (*stē-ăr'ĭk*) **acid, 1227, 1476.**
**Ste'arin, 1227, 1476.**
**Ste'atite,** a form of talc, **3430.**
**Sted'man, Edmund Clarence** (1833–1908). Amer. banker, poet, critic, and editor ('The Nature and Elements of Poetry'; 'Victorian Poets'; 'An American Anthology').
**Steel, 3352, 1815–26;** alloys, **99, 2135, 2507, 2831, 3548;** Damascus, **957;** melting point, **1362.** *See also in Index* **Iron and steel.**
**Steel construction:** bridges, **506;** buildings, **529–31;** ships, **3212–7.**
**Steele, Sir Richard** (1672–1729), Brit. essayist, associate of Addison on the *Spectator,* **1165, 1166, 1178, 3406.**
**Steelhead,** a salmon, **3114.**
**Steel pens, 2710.**
**Steel Rudd,** pen name of Arthur Hoey Davis (born 1861), Australian author, **268.**
**Steel ships, 3212–8.**
**Steelton,** Pa. Steel-mfg. borough 3 mi. s.e. of Harrisburg; pop. 13,428; extensive works of Pennsylvania Steel Co.
**Steelyard,** Hanseatic headquarters in London, **1576.**
**Steen, Jan Havicksz** (1626–79). Dutch genre painter ('Feast of St. Nicholas'; 'Music Master').
**Steenkerke** (*stān-kĕrk'ē*), Belgium. Village 20 mi. s.w. of Brussels where Dutch and English under William III of England were defeated by French (1692).
**Steeple,** origin of, **295.**
**Steeplebush,** a variety of spirea, **3327.**
**Stefansson** (*stā'fäns-sōn*), **Vilhjalmur** (born 1879), Arctic explorer, b. Canada; on 2d expedition (1908–12) discovered "blond" Eskimos who had never seen a white man; on 3d expedition (1913–18) discovered 3 large and several small isls.; also revolutionized Arctic research by living for months without supplies, killing seal, deer, and musk-oxen for food ('The Friendly Arctic'); ship, *picture,* **2860.**
**Steffe, William,** Amer. composer, **2405.**
**Steganop'odes,** order of water-birds, **412, 413.**
**Stegomy'ia mosquito, 2336, 2651–4.**
**Steg'osaur,** prehistoric reptile, **134,** *picture,* **137.**
**Stein** (*shtīn*), **Heinrich Friedrich Karl, Baron von** (1757–1831). Prussian statesman; abolished serfdom, reformed army, and laid foundation for Prussia's power.
**Steinbok,** an African antelope, **146.**
**Steinbok,** an Alpine ibex, **1719.**
**Stein'metz, Charles Proteus** (born 1865). Amer. electrical engineer, b. Germany.
**"Stella,"** Swift's friend Esther Johnson, **3406.**
**Stellarton,** Nova Scotia. Center of rich coal-mining region on East R., about 75 mi. n.e. of Halifax; pop. 5500; numerous mfrs.
**Stellite** or **star-stone, 99.**
**Stem,** of plants, *picture,* **2822;** modified in water-plants, **3700;** potato an underground stem, **2901, 532;** structure of tree trunk, **3530–2;** underground, **532;** why sap rises, **2825–6.**
**Stem duchies,** in Germany, **1447.**
**Stem rust,** a grain parasite, **3099.**
**Stendhal** (*stän-däl'*). Pen name of Marie Henri Beyle (1783–1842), Fr. writer and critic, whose famous novels, 'Le Rouge et Noir' and 'La Chartreuse de Parme', had tremendous influence on the development of the Fr. novel; a profound interpreter of the human soul.
**Sten'ograph, 3225.**
**Stenog'raphy** or **shorthand, 3224–5.**
**Sten'otype, 3225.**
**Sten'tor.** In the 'Iliad', Gk. herald whose voice was loud as that of 50 men.
**Step-down transformer, 3523.**
**Stephen** (*stē'vĕn*) (1097?–1154), king of England, **3352;** besieges Matilda at Oxford, **2608;** recognizes Henry II as successor, **1633.**
**Stephen, Saint** (977–1038), first king of Hungary, crowned 1000; Christianized and civilized kingdom; the "crown of St. Stephen" was age-long symbol of Hungarian monarchy; **1703.**
**Stephen, Saint,** first Christian martyr; stoned to death as blasphemer (Acts vi-vii), **2156.**
**Stephen, Sir Leslie** (1832–1904). Eng. biographer and essayist; editor of 'The Dictionary of National Biography'; wrote lives of Samuel Johnson, Pope, Swift, and numerous essays and sketches on 18th and 19th cent. literature.
**Stephen Bathori** (1522–86). Second elected king of Poland, succeeded Henry of Valois in 1575; seized Livonia from Russia, and organized first Cossack regiment.
**Stephens, Alexander Hamilton** (1812–83), vice-president of the Confederate States of America, **3353.**
**Stephens, James** (born 1882). Irish poet and short-story writer; subtle humor and delicate fancy are tied to a keen appreciation of Irish character ('Insurrections'; 'The Hill of Visions'; 'Songs from the Clay'; 'Here are Ladies').
**Stephenson** (*stē'vĕn-sŏn*), **George** (1781–1848), Eng. engineer, **3353;** first successful locomotive, **2043, 2044, 2962;** and Ericsson, **1173;** invention ridiculed, **1221, 1797.**
**Stephenson, Robert** (1803–59), Eng. engineer, son of George Stephenson; builder of Britannia tubular bridge over Menai Straits and Victoria tubular bridge over St. Lawrence at Montreal; assists father, **3353.**
**Stepney.** Metropolitan borough of London, England; 1766 acres; pop. 300,000; includes Whitechapel, Limehouse, and Mile End, famous slum districts; Tower of London and Royal Mint.
**Steppes** (*stĕps*), **2790;** in Asia, **230, 3228, 1413;** of Hungary, **1702;** in Russia, **3086, 1190–1.**
**Step-up transformer, 3523.**
**Ster'eograph,** a picture giving appearance of depth, **3354.**
**Stereop'ticon,** a picture-projecting lantern, **3353–4.**
**Ster'eoscope,** optical device, **3354.**
**Ster'eotyping,** in printing, **3355, 2472,** *picture,* **2473;** contrasted with electrotyping, **1125.**
**Steriliza'tion, 150, 151.**
**Sterlet,** a sturgeon, **3374.**
**"Sterling" silver,** composition, **99.**
**Sterne** (*stērn*), **Laurence** (1713–68), Brit. novelist, humorist, and sentimentalist ('Tristram Shandy'; 'Sentimental Journey'); contribution to the novel, **1166, 2540.**
**Stettin** (*shtĕ-tēn'*), Germany, port on Oder R. 17 mi. above mouth; pop. 233,000; great Vulcan shipyard; large clothing mfrs.; wharves reserved for Czecho-Slovakia; **1440.**
**Steu'ben, Frederick William Augustus, Baron von** (1730–94), Ger. officer in Amer. Rev. War, **3355, 3004, 3615.**
**Steu'benville,** Ohio, city on Ohio R., 35 mi. s.w. of Pittsburgh, in coal, natural gas, and oil region; pop. 28,508; iron and steel products, soap, tin plate, clay, pottery, glass; **2570.**
**Steu'nenberg, Frank** (1861–1905), gov. of Idaho 1897–1901; b. Keokuk, Iowa; assassinated, **1727.**
**Stevens, Alfred** (1828–1906). Belg. painter, whose finished technique and careful execution greatly influenced many of his contemporaries; particularly successful in portraits of ladies of fashion.
**Stevens, Alfred** (1818–75). Eng. sculptor, spent nearly 20 years on Wellington monument and tomb in St. Paul's Cathedral.
**Stevens, John** (1749–1838), Amer. engineer and inventor, b. New York City; helped secure Amer. patent system; built *Phoenix* 1807 which ran successfully on Delaware R.; invents screw propeller, **3212.**
**Stevens, John F.** (born 1853). Amer. civil engineer, b. Gardiner, Me.; chief engineer of Panama Canal 1905–07.
**Stevens, Thaddeus** (1792–1868). Amer. statesman, b. Danville, Vt.; abolitionist, bitter critic of compromise measures before Civil War and conciliation after.

**Stevens Institute of Technology.** At Castle Point, Hoboken, N.J.; for men; founded 1870; electrical, civil, chemical, hydraulic, mechanical engineering, shop and laboratory work.
**Stevenson, Adlai E.** (1835–1914), Amer. statesman, b. Christian County, Ky.; vice-president of U.S., **790, 3636;** defeated for re-election, **3060.**
**Stevenson, Mrs. Fanny van de Grift Osbourne, 3356.**
**Stevenson, Robert** (1772–1850). Scotch engineer, inventor of intermittent lights for lighthouses; built Bell Rock and many other lighthouses on Scotch coast; grandfather of Robert Louis Stevenson.
**Stevenson, Robert Louis** (1850–94), Eng. story-writer, poet, and essayist, **3355–6, 1167, 1178;** medallion by Saint-Gaudens, **3107;** quoted, **1047, 1080, 2587.**
**Stevens Point,** Wis. City on Wisconsin R., 100 mi. n. of Madison; pop. 11,371; excellent water-power; lumber, artificial flies for fishing, self-rocking cradles, paper.
**Stevinus** (*stē-vē'nŭs*), **Simon** (1548–1620), Duteh mathematieian; invented deeimal system, **975.**
**Stewart,** Scotch royal house. Same as **Stuart.**
**Stewart, Dugald** (1753–1828), Scotch philosopher of the "common sense" school; immensely popular lecturer at U. of Edinburgh; **2773.**
**Stewart, Robert.** *See in Index* **Castlereagh.**
**Stewart, William Morris** (1827–1909). U.S. lawyer and senator; developed famous Comstock lode and made fortune in Nevada mines.
**Stewart Island,** one of New Zealand group; 662 sq. mi.; **2500,** *map,* **264–5.**
**Stib'nite,** an ore of antimony, **150.**
**Stick-insect,** various insects resembling branches and twigs of trees; *pictures,* **1785, 2925.**
**Stickleback,** a fish, **3357.**
**Stig'ma,** the pollen-catching structure in flowers, **1304–10;** in yellow water-lily, *picture,* **474.**
**Stig'mata,** of St. Francis, **1355.**
**Stikine** or **Stickeen** (*stĭ-kēn'*), river rising in n. British Columbia; flows 500 mi. to Alaskan eoast; *map,* **602–3.**
**Stilicho** (*stĭl'ĭ-kō*), **Flavius** (359?–408 A.D.), Rom. general and statesman of Vandal birth; as guardian of feeble Emperor Honorius was virtual ruler of W. Empire; **73.**
**Still, Andrew Taylor** (1828–1917), Amer. physieian; founder of osteopathy, **2603.**
**Stillwater, battles of.** *See in Index* **Saratoga, battles of.**
**Stilt,** a long-legged shore-bird, **2839.**
**Stilton cheese, 709.**
**Stilts,** used by Fr. shepherds, *picture,* **1347.**
**Sting,** of bee, *picture,* **1786;** of insects, **1787;** of scorpion, **3145;** of wasps, **3692.**
**Sting-ray,** a fish, **3244,** *picture,* **1272.**
**Stinkweed.** Saine as **Jimson weed.**
**Stin'nes, Hugo** (born 1870). Ger. industrial manager and finaneier; leading figure in post-war reconstruction; organized a gigantic interlocking business based on the mining industry and ineluding many subsidiary enterprises such as shipping, electrie power, and street railways; after World War bought several newspapers to serve as his organs.
**Stipple engraving, 1170.**
**Stip'ules,** fastening structures of leaves, **1982.**
**Stirling,** Seotland. Mfg. town and port on Forth R., 30 mi. n.w. of Edinburgh; pop. 22,000; famous in wars of England and Scotland.
**Stirling Bridge, battle of,** between Scotch and English (1297), **3667.**
**Stirling Castle,** *picture,* **656;** battle of Bannoekburn, **518.**
**Stirring dredge, 1041.**
**Stoat,** the ermine, **1174.**
**Stock, Frederick A.** (born 1872). Amer. musical conductor and composer, b. Germany; director since 1905 of Chicago Symphony Orchestra.
**Stock,** in fruit grafting, **1377.**
**Stock dividend, 3358.**
**Stock Exchange, 3359–60.**
**Stock'holm,** Sweden, cap. and commercial center of Sweden, on e. coast; pop. 410,000; **3357–8, 3402,** *pictures,* **3403, 3405.**
**Stockholm tar, 3436.**
**Stockings,** how knit, **1935–7.**
**Stockport,** England. Mfg. town on Mersey R. 5 mi. s.e. of Manchester; pop. 131,000; cotton mills, hat factories, foundries, breweries.
**Stock raising.** *See in Index* **Live stock.**
**Stocks,** form of punishment, **2919.**
**Stocks and bonds, 3358–60.**
**Stockton, Frank Richard** (1834–1902). Amer. humorist ('The Lady or the Tiger?'—famous dilemma story; 'Rudder Grange').
**Stockton, Robert Field** (1796–1866), Amer. naval officer, b. Princeton, N.J.; served in War of 1812; with Fremont conquered California 1846–47; **2063.**
**Stockton,** Calif. A distributing, and industrial center 65 mi. n.w. of San Francisco on arm of San Joaquin R.; pop. 40,296; farming and fruit trade; agricultural and mining machinery, flour, lumber products, canned goods.
**Stockton & Darlington Railway, 2044, 3353, 2962, 2963.**
**Stockton-on-Tees.** Seaport in n.e. England near mouth of Tees R.; pop. 64,000; large iron and steel shipyards, potteries.
**Stockyards, 2180–5.** *See also in Index* **Meat packing.**
**Stoddard, Charles Warren** (1843–1909). Amer. author of books of travel, especially on the South Seas ('South Sea Idylls'; 'The Lepers of Molokai'; 'Hawaiian Life'; 'The Island of Tranquil Delights'); b. Rochester, N.Y.
**Stoddard, Richard Henry** (1825–1903). Amer. poet, eritic, and editor, b. Hingham, Mass. ('Abraham Lincoln'; 'The Book of the East'; 'Songs of Summer').
**Stoicism** (*stō'ĭ-sĭsm*), school of philosophy: Epictetus, **1173;** Mareus Aurelius, **2147.**
**Stoke-upon-Trent,** England. Center of "Potteries" district, 35 mi. s.e. of Liverpool; pop. 250,000; formed by union of Stoke-upon-Trent with neighboring towns; porcelain and pottery mfr.
**Sto'la,** Rom. garment, **897.**
**Stolzenfels** (*shtōlts'ĕn-fĕls*), castle 4 mi. s. of Coblenz, Germany, founded 13th eent., **3005.**
**Stomach** (*stŏm'ăk*), **3360, 1010–1,** *picture,* **2794;** action of pepsin, **1173;** action of rennin, **1173;** of birds, **400;** muscles, **2373;** nerves, **2437;** of ruminants, **3082, 663;** of starfish, **3345.**
**Sto'mata** (plural of **stoma**), minute openings in tissue; in leaves, **1980;** in water-plants, **3700.**
**Stone, Lucy** (1818–93), Amer. reformer and woman suffragist; married Dr. Henry B. Blackwell, but retained her maiden name; **3778.**
**Stone, Samuel** (1602?–63), Amer. clergyman and colonist, b. Hertford, England; settles Connecticut, **867.**
**Stone.** *See in Index* **Building construction and materials; Rock.**
**Stone,** a unit of weight, **3715.**
**Stone Age, 3360–1, 1655;** giant bison, *picture,* **429;** bread, **496;** cave-dwellers, **666–70;** contribution to civilization, **771–2;** dogs domesticated, **1018;** remains in Egypt, **1098;** mammoth hunt, *picture,* **2132;** relics in Isle of Man, **2134;** Neolithic peoples, **2133;** painting in, **2627,** *picture,* **2628;** story, 'How Big-Head Slew the Cave-Bear', **668–70.**
**Stonechat.** A small European bird (*Pratincola rubicola*), so named from its clicking note; its plumage is black above and dark reddish underneath.
**Stonehenge** (*stōn'hĕnġ*), England, eelebrated prehistoric monument on Salisbury Plain, about 8 mi. n. of Salisbury; consists of circular group of huge stones; **3361.**
**Stone-marten, 2156.**
**Stone Mountain,** Ga., granite hill 16 mi. e. of Atlanta, **1431.**
**Stone River,** Tenn. Tributary of Cumberland R., which enters 5 mi. above Nashville. *See also in Index* **Murfreesboro.**
**Stones, precious.** *See in Index* **Gems.**
**'Stones of Venice',** book by John Ruskin in whieh he expounds his theories of the relation of architecture to all other human activities, **3083.**
**"Stonewall Jackson," 1858.**
**Stonewort,** a type of alga, **3937.**
**Stoney, G. Johnstone,** Brit. physicist, **1122.**
**Stonington,** Conn. Port on Long Island Sound, 8 mi. e. of New London; pop. 10,236; machinery, textiles, thread, fertilizers, fish; bombarded during Revolution and War of 1812.
**Stony Point,** N.Y., village on promontory on Hudson R., 35 mi. n. of New York City; taken by Clinton (1779); stormed and recaptured by Anthony Wayne, **3707.**
**Stop,** in organ. **2598, 2599, 2600.**
**Stop-watch, 803.**
**Storage battery, 3361–2;** contrasted with "primary cell," **1113.**
**Storax,** a gum-resin, **2728.**
**Stories:** 'Adventures of the Great-Hearted Odysseus', **2562–6;** 'Adventures of the Great Hercules', **1640–1;** 'Adventures of Howler the Monkey', **2293–7;** 'Adventures of Robin Hood and His Merry Men', **3029–33;** 'Aladdin and the Wonderful Lamp', **169–72;** 'Aliee in Wonderland', **647–50;** 'Androcles and the Lion', **2025;** 'The Apples of Iduna', **3135–6;** 'Bayeta's Grandmother's Blanket', **204–7;** 'The Blue Bird', **2112–5;** 'Canterbury Tales', **704–7;** 'Children of the Desert', **167–8;** 'Children of the Pilgrims', **2844–6;** 'The Children of Topsy-Turvy Land' (Japan). **1870–2;** 'Colonel Neweome', **3480–1;** 'A Day's Visit in Eskimo Land', **1175–7;** 'Death of Hector', **1626–7;** 'Dante's Divine Comedy', **958–61;** 'Don Quixote', **683–4;** 'The Dream of Chief Winnemucka', **2447–8;** 'Mr. Earthworm Tells His Own Story', **1067–8;** 'Fairy Calf of Tipperary', **1812–4;** 'Fleetfoot the Deer', **982–5;** 'Mr. Fluffy Tail and Miss Curly Loeks', **3335–7;** 'The Greek Hero who Slew the Medusa' (Perseus), **2731–2;** 'Greyfriars Bobby', **1024–5;** 'Gulliver's Visit to Lilliput', **3407–10;** 'The Story of Hiawatha', **2059–61;** 'How Alice Rode to the Golden Gate', **582–7;** 'How Arthur Won His Crown', **223–4;** 'How Big-Head Slew the Cave-Bear', **668–70;** 'How Horatius Kept the Bridge', **3494–5;** 'How Mr. Rabbit Lost His Tail', **1586–8;** 'How the Mouse Grew So Small', **2360–2;** 'How the Ocean Saved Leyden from the Spaniards', **2443;** 'How Odysseus and His Men Outwitted the Cyclops', **944–5;** 'How the Tricolor Came Back to Metz', **103–4;** 'How the Whale Learned to Smoke', **3727–9;** 'Jean Valjean' ('Les Miserables'), **1695–6;** 'The Jewish Maiden who Became Queen of Persia' (Esther), **1179–80;** 'Jimmy, a Tame

Crow', **927–9**; 'Johnny Bear', **351–4**; 'King Arthur's Round Table', **3069–70**; 'Life in a Maple Sugar Camp', **2138–42**; 'Little Eagle-Heart and His Sister Laughing-Water', **1775–6**; 'Lost in Chicago', **726–8**; 'The Luck of the Calico Horse', **1686–7**; 'The Lynx with Wings', **2088–91**; 'The Man Without a Country', **1562–5**; 'Mogul, the Baby Elephant', **1128–32**; 'Mowgli', **1927–9**; 'Mr. Coon Who Wouldn't Change His Mind', **2952–5**; 'A New American—The Story of Mary Antin', **1739–40**; 'Odysseus and Circe', **767–8**; 'Old Abc, the War Eagle', **1055–6**; 'Paradise Lost', **2244–6**; 'Peter Pan', **334–7**; 'Mr. Pickwick and the Pickwick People', **1007–10**; 'The Pigeon that Won a War Medal', **2806**; 'Pilgrim's Progress', **535–8**; 'Reynard the Fox', **1337–8**; 'Robinson Crusoe in Fact and Fiction', **933–4**; 'The Shield of Achilles', **9**; 'Silas Marner', **1135–6**; 'Tiny Tim', **760–2**; 'The Tournament of Ashby', **3152–3**; 'The Trojan War', **3542–3**; 'What the Crawfishes Had to Say for Themselves', **916–7**; 'Why the Tortoise Bites So Hard', **3564–8**; 'Wolf-Wind and the Children', **611–5**; 'The Wooden Horse', **3543–4**; 'Wung Foo's Busy Day', **749–52**. *See also in Index* **Literature for children; Story-telling.**

**Stories for children,** list, **2029–30.**

**Stork,** a large wading bird, **3362, 3365, 412,** *pictures,* **3363, 3364;** in Denmark, **994;** foot, **409.**

**Storm, Theodor** (1817–88), Ger. novelist and poet, master of the short story, **1438,** *picture,* **1436.**

**"Storm and stress,"** movement in Ger. literature, **1438.**

**Storm-petrel, 2747.**

**Storms, 3366–7;** in Caribbean Sea, **644;** cyclonic, **944, 2973;** equatorial thundershowers, **2972–3;** equinoctial, **1173;** forecasting, **3707–8, 333;** hail, **1559;** lightning, **2006–7;** sand, **3121–2;** wind, **3751.**

**Storthing** (*stôr'ting*), Norwegian Parliament, **2536.**

**Story, Joseph** (1779–1845), Amer. jurist, b. Marblehead, Mass.; 34 years associate justice of U.S. Supreme Court; with Chief Justice Marshall established powers of Supreme Court, and with Chancellor Kent molded Amer. equity jurisprudence.

**Story, William Wetmore** (1819–95). Amer. sculptor and poet, b. Salem, Mass.; son of Joseph Story ('Cleopatra', enthusiastically described in Hawthorne's 'Marble Faun'; many fine statues and portrait busts); his studio in Rome for 45 years a social center for Amer. and Eng. artists and authors.

**Story-telling, 3367–8.** *See also in Index* **Stories.**

**Stoss** (*shtôs*), **Veit** (1440?–1533). Ger. sculptor and one of the greatest Ger. wood carvers; carved altars and tombs in churches at Nuremberg and Cracow.

**Stoth'ard, Thomas** (1755–1834). Eng. painter and engraver, noted for the uniform grace and distinction with which he illustrated 'Robinson Crusoe', 'Pilgrim's Progress', 'The Vicar of Wakefield', and many other works.

**Stour** (*stụr*), a small river in Kent, England, **637.**

**Stovaine** (*stō'vȧ-ĭn*), an anesthetic drug, **125.**

**Stoves and fireplaces, 3368;** heating efficiency, **1622;** Franklin stove, **3368, 1357.**

**Stowe, Harriet Beecher** (1811–96), Amer. novelist, author of 'Uncle Tom's Cabin', **3368.**

**Strabo** (*strā'bō*) (born 63 B.C.), Gk. geographer and historian; wrote first general treatise on geography with collection of all geographical knowledge attainable; **1538.**

**Strachan** (*strạn*). **John** (1778–1867). Canadian clergyman, first bishop of Toronto; became leading spirit in the 'Family Compact'; first pres. of U. of Toronto and founder of Trinity Univ.

**Strachey** (*strā'ki*), **G. Lytton** (born 1880). Eng. essayist and biographer ('Eminent Victorians'; 'Queen Victoria'; 'Books and Characters'); a profound analyst who clothes his thoughts in brilliant style.

**Stradivari** or **Stradivarius** (*străd-ĭ-vā'rĭ-ŭs*), **Antonio** (1644–1737), Ital. (Cremona) violin-maker, greatest that ever lived; pupil of Nicolo Amati; **3646,** *picture,* **3645.**

**Strafford, Thomas Wentworth, Earl of** (1593–1641), Eng. statesman, strong believer in absolute royal power; advised Charles I to resist Parliament; executed for treason by Long Parliament; **691, 693.**

**"Straight" flour, 1303.**

**Straits Settlements,** Brit. crown colony in Malay Peninsula, 1600 sq. mi.; pop. 846,000; great stratcgic value; free ports, immense transit trade; **2130;** Singapore, **3243.**

**Strake,** in ship construction, **3217.**

**Stralsund** (*shträl'zụnt*), Germany, Baltic port; pop. 35,000; important member of Hansa League; Wallenstein's siege in Thirty Years' War, **3488.**

**Stramo'nium.** Same as **Jimson weed.**

**Strand.** Business thoroughfare in London; formerly led from city to Westminster along marshy bank of Thames, hence the name.

**Strang, William** (1859–1921). Eng. painter and etcher (etched portraits of Kipling, Thomas Hardy, Stevenson; illustrated 'Pilgrim's Progress', 'Sinbad the Sailor', 'Baron Munchausen', and other classics).

**"Strasac,"** Bohemian folk-dance, *picture,* **1319.**

**Strasbourg** (*sträs-bọr'*) (German **Strassburg),** France, city in Alsace, 75 mi. e. of Nancy; pop. 180,000; **103, 104;** famous clock, **798;** pâté de foie gras, **1487;** statue in Paris, **2682;** street scene, *picture,* **1342.**

**Stratford,** Conn. Town on Housatonic R., 2 mi. from mouth, 3 mi. n.e. of Bridgeport; pop. 12,347; makes paints, silverware, brassware.

**Stratford,** Ontario. Industrial city and farming center on Avon R., 85 mi. s.w. of Toronto; pop. 16,500; r.r. shops; makes furniture, iron and brass products, textiles, machinery, electrical appliances, flour, cheese.

**Stratford-on-Avon,** England, town in Warwickshire; pop. 10,000; **3369,** *pictures.* **1190, 3189, 3190;** Shakespeare, **3189, 3191.**

**Strathclyde.** Anc. Brit. kingdom extending from Clyde to Derwent R.; stronghold of original Celt inhabitants against invading Anglo-Saxons (7th–11th cents.).

**Strathco'na and Mount Royal, Donald A. Smith,** first **Baron** (1820–1914), Canadian financier and railway builder, **3369;** and Dr. Grenfell, **1541.**

**Strathcona's Horse, 3369.**

**Strat'ified rocks,** those occurring in layers, **2944.**

**Stra'tus clouds, 809,** *picture,* **808.**

**Straus** (*strous*), **Nathan** (born 1848). Amer. (Jewish) merchant and philanthropist, b. Bavaria; established distribution of coal and pasteurized milk to New York poor, and soup kitchens and anti-malarial bureau in Jerusalem; brother of Oscar Straus.

**Straus, Oscar Solomon** (born 1850). Amer. lawyer and diplomat, b. Bavaria of Jewish parents; minister to Turkey 1887–89, 1898–1901; ambassador to Turkey 1909–10; sec. of commerce and labor 1906–09; succeeded (1902) Benjamin Harrison as member of Permanent Court of Arbitration at Hague.

**Strauss** (*shtrous*), **David Friedrich** (1808–74). Ger. theologian, whose famous 'Life of Jesus' attempts to explain gospel narratives as essentially mythical.

**Strauss, Johann** (1825–99). A popular Austrian composer, called the "Waltz King" ('Beautiful Blue Danube', most celebrated of his more than 500 waltzes); son of Johann Strauss the Elder, also eminent composer of dance music.

**Strauss, Richard** (born 1864), Ger. composer and conductor, **3369–70, 2380, 2584.**

**Stravin'sky, Igor** (born 1882). Russian composer, especially noted for musical settings for ballets ('L'Oiseau de Feu'; 'Petrouchka'; 'Le Sacre du Printemps').

**Straw,** from oats, **2549;** in papermaking, **2667;** rye, **3102.**

**Strawberry, 3370;** a fleshy fruit, **1380;** related to rose, **3066.**

**Strawberry River,** in n.-cent. Utah, **3610.**

**Strawboard, 2673.**

**Straw hats, 1597.**

**Streator** (*strē'tôr*), Ill. Distributing center on Vermilion R., 80 mi. s.w. of Chicago; pop. 14,779; in coal and agricultural region; glass, brick, sewer pipe.

**Street cleaning, 1614.**

**Street railways, 3370–2;** dynamos, **1050–2;** electric motor, **1124–5;** fare register on cars, **572;** monorail, **1555;** subway, *picture,* **2498;** public utilities, **2932.**

**Streets.** *See in Index* **Roads and streets.**

**Strelt'si** or **Strel'itz,** household troops of the czars, instituted by Ivan the Terrible; backbone of Rus. army in 16th and 17th cents.; frequent mutinies led to abolition by Peter I; **2747.**

**Streptococcus** (*strĕp-tō-kŏk'ŭs*), a pus-producing bacterium, **1452.**

**Stresa** (*strā'zä*), Italy, village and Alpine resort on Lake Maggiore, *picture,* **1193.**

**Stretcher,** how to make, **1266.**

**Strickland, Agnes** (1806–74). Eng. historical writer ('Lives of the Queens of England').

**"Strict construction,"** in U.S. politics, **1882, 2870.**

**Strikes,** cessation of labor by employees to enforce their demands upon their employer, or to protest against his actions; sympathetic strike is one called by workers without a grievance in behalf of strikers in another field; general strike is one carried out in all fields of labor simultaneously; arbitration of, **172–3, 269, 2500;** anthracite coal (1902), **172, 3060;** injunction used by Taft, **3427–8;** Pullman (1894), **791;** railroad (1916) averted by Adamson Law, **3747.**

**Strindberg** (*strĭnd'bĕrĸ*), **August** (1849–1912), Swedish novelist and dramatist; chief plays, **1038;** work characterized. **3134.**

**Stringed instruments, 2381, 2383,** *pictures,* **2382;** in orchestra, **2590, 3646.** *See also in Index* **Harp; Piano;** etc.

**Stringer, Arthur** (born 1874), Canadian journalist and fiction writer, **624.**

**Striped gopher, 1489.**

**Striped hyena, 1748.**

**Striped maple,** seeds, *picture,* **3172.**

**Strobila** (*strō-bī'lȧ*), of jelly-fish, *picture,* **1884.**

**Stromboli** (*strŏm'bō-lē*), **Mt.,** active volcano 3000 ft. high on Stromboli, one of Lipari Isls., **1971, 2194.**

**Strongbow.** Nickname of Richard de Clare, earl of Pembroke (d. 1176), Eng. noble who at appeal of Der-

mot of Leinster began Eng. conquest of Ireland. "Strongbow was the statesman as the Fitzgeralds were the soldiers of the conquest."
**Strong verbs,** 3628.
**Stronsay** (*strŏn'sā*), one of Orkneys, 7 mi. long, **2601.**
**Stron'tium,** a yellowish metallic element, **4042.**
**Strouds'burg,** Pa., popular mt. resort 38 mi. s.e. of Scranton; car works, flour, silk and woolen mills; **989.**
**Strozzi** (*strŏt'sē*) **Palace,** Florence, built 15th cent.; willed to state 1907; **1848.**
**Structural steel,** 506, 530, 3217.
**Structural zoölogy,** 3841.
**"Struggle for existence,"** competition among living organisms for means of livelihood; battle between weeds and crops, **3712;** character and consequences among animals, **127;** among fish, **1275–7;** in forest, **1327;** among insects, **1781–2;** among plants, **2827;** protective coloration a factor, **2923–6;** results in survival of the fittest, **1210, 964.**
**Strychnine** (*strĭk'nĭn*), a poisonous drug, **3372, 2855, 1042.**
**Strych'nos nux-vom'ica,** a tree yielding poisons strychnine and brucine, **3372,** *picture,* **2855.**
**Stu'art,** royal family in Scotland and England, **3372, 1860–1, 691–4, 2157, 139;** attempts to regain throne, **2914–5, 3149.** *See also in Index* **Jacobites.**
**Stuart, Lady Arabella** (1575–1615). Cousin of James I; center of Eng. political intrigue because a possible heir to throne; imprisoned for life after making forbidden marriage.
**Stuart, Charles Edward** (1720–88), the Young Pretender, **2914–5.**
**Stuart, Gilbert** (1755–1828), Amer. artist, one of greatest portrait painters of his time, **2634;** and origin of "Gerrymander," **1452.**
**Stuart, James.** *See in Index* **Murray, James Stuart, Earl of.**
**Stuart, James Ewell Brown** (1833–64). Confederate Civil War general, great cavalry raider. General Johnston said, "How can I sleep unless he is on outpost?" and General Lee, "He never brought me a false report."
**Stuart, James Francis Edward** (1688–1766), the Old Pretender, **2914.**
**Stuart, Ruth McEnery** (1856–1917). Amer. author and humorist, b. Avoyelles, La. ('Moriah's Mourning'; 'Sonny').
**Stubbs, William** (1825–1901). Bishop of Oxford and one of the foremost historians of his time ('Constitutional History of England'—still the standard authority).
**Stucco** (*stŭk'ō*), **532.**
**Stuck, Hudson** (1863–1920), Amer. clergyman, b. England; archdeacon of Yukon after 1904; ascends Mt. McKinley, **2103.**
**Study,** 3372–4; memory, **2197.**
**Sturdee, Sir Frederick Charles Doveton** (born 1859). Brit. admiral who sank Ger. squadron in battle of the Falkland Isls. Dec. 8, 1914.
**Stur'geon, William** (1783–1850), Eng. physicist, inventor of electromagnet, **1121.**
**Sturgeon,** a large fish, **3374, 1279,** *picture,* **1272;** source of gelatin, **1409;** isinglass made from, **1832.**
**Stur'nidae,** starling family, **412.**
**Stuttgart** (*shtŭt'gärt*), Germany, cap. of Republic of Württemberg; pop. 310,000; fine collections of art and antiquities; publishing center; **1441.**
**Stuyvesant** (*stī'vĕ-sănt*), **Peter** (1592–1672), last Dutch colonial gov. of New York, **3374–5, 2497.**
**Style,** stem which supports the stigma of a flower, **1304-10.**
**Style,** in dress, **897–901.**
**Style, literary,** 3004–5.
**Stylites, Simeon.** *See in Index* **Simeon Stylites.**
**Stylograph'ic pen,** 2712.
**Sty'lops,** a type of beetle, **371.**
**Sty'lus,** 2709.
**Stympha'lian birds,** in Gk. myth., **1640.**
**Styria** (*stĭr'i-ȧ*), mountainous dist. in s.e. Austria and n.w. Jugo-Slavia; formerly Austrian crownland; 8600 sq. mi.; forests, valuable minerals (iron); **269.**
**Styx** (*stĭks*), in Gk. myth., r. over which dead were ferried, **1558;** and Achilles, **8.**
**Subconsciousness,** a state of mental activity unaccompanied by consciousness; abnormally manifested in hypnotism, **1717–8.**
**Sub-irrigation,** 1830.
**Subject,** of a sentence, **1493, 3174.**
**Subjunc'tive mode,** 3627.
**Sublima'tion,** of camphor, **594.**
**Sublimed' sulphur,** 3390.
**Sublime Porte, The.** Turkish govt., so called from high gate giving access to building containing state dept. offices.
**Submarine',** 3375–8; conning tower, *picture,* **2427;** Diesel engines, **1406;** Fulton's experiments, **1381;** greatest depth reached, *picture,* **51;** influence on naval warfare, **2428, 437, 1794;** periscope, **2730;** torpedoes, **3517–20,** *picture,* **2427;** in World War, **3791, 3796, 3799–3800, 316.**
**Submarine cables,** 556–61.
**Submarine chasers,** 2357, 3803.
**Submarine mines,** 3517–20.
**Submarine photography,** 2342, *picture,* **2778.**
**Subor'dinate conjunctions,** 862.
**Subotica** (*sụ-bô'tē-cä*). *See in Index* **Theresiopel.**
**Subpoena** (*sŭb-pē'nȧ*) (Latin, "under penalty"). A judicial writ requiring a person to appear at a certain time and place; commonly used to compel attendance of witnesses at court trials; penalty imposed for failure to comply.
**Subsoil,** reached by alfalfa roots, **89.**
**Sub-species,** in biological classification, **412.**
**Subtrac'tion,** 3379–83; in algebra, **94;** of decimals, **972–3;** of fractions, **1338–40;** of mixed numbers, **1341.**
**Subway,** 3550–2, 3370; in London, **2056;** in New York City, **2495,** *picture,* **2498;** Paris "Métro," **2685.**
**Succes'sion, Act of** (1701), in Eng. history, **139.**
**Suc'cotash,** 890.
**Suchow.** Same as **Soochow.**
**Sucker.** Various freshwater fish of the carp family; mouths on under surface of head; fleshy lips; suck mud and organic matter from bottom; except one Siberian species, all are native to U.S.
**Suckling, Sir John** (1609–42), Eng. "cavalier poet," whose gay, charming lyrics are full of oft-quoted lines, especially the 'Ballade upon a Wedding', **1164.**
**Sucre** (*sụ'krā*), **Antonio José de** (1793–1830). S. Amer. soldier, aide of Bolivar; first president of Bolivia 1826–28; drove Spanish from Upper Peru (Bolivia) 1824, in brilliant battle of Ayacucho.
**Sucre.** Nominal cap. of Bolivia; pop. 30,000; on high Andean plateau in s.-cent. part; colonial La Plata; became Sucre upon declaration of independence 1825; univ.
**Su'crose,** cane or beet sugar, **3388, 3389.**
**Suction pump,** 2934, 53, *pictures,* **2935.**
**Sudan** (*sụ-dän'*), a vast region (over 2,000,000 sq. mi.) in cent. Africa, between Sahara Desert and Congo basin; pop. between 10 and 20 million; **3384, 34;** anc. trade, **1102;** natives, **34, 37,** *picture,* **35.**
**Sudan, Anglo-Egyptian, or Lower Egypt;** African territory under joint Brit. and Egypt. control; over 1,000,000 sq. mi.; pop. 3,400,000; **1093,** *map,* **1095;** Gordon in, **1489;** Kitchener, **1929.**
**Sudan, French.** A colony in Fr. W. Africa, formerly called Upper Senegal-Niger; includes w. part of Sudan; 366,700 sq. mi.; pop. 2,400,000.
**Sudan grass.** A hay grass introduced into the U.S. from the Sudan and found valuable in semi-arid regions; it has no perennial rootstock; it is treated as an annual but it becomes a perennial in frostless regions; in Hawaii it has been found the most valuable grass ever introduced.
**Sudbury,** Ontario, town 30 mi. n. of Georgian Bay; pop. 9000; smelters, planing mills, machine shops, large creosoting plant, govt. school of mines, Jesuit College; nickel deposits, **2582, 2507.**
**Sudermann** (*zụ'dĕr-män*), **Hermann** (born 1857), Ger. dramatist and novelist, **1036, 1038, 1438.**
**Sudetic Mts.** or **Sudetes** (Ger. Sudeten), range along n.e. border of Moraira and Bohemia; *map,* **271.**
**Su'dras,** Hindu caste, **1750, 1651.**
**Sue** (*sü*), **Eugene** (1804–57), Fr. novelist, popular and sensational; 'The Wandering Jew', **3669.**
**Suède** (*swād*) **leather,** 1977; gloves, **1475.**
**Suetonius** (*swē-tō'nĭ-ŭs*) **Tranquillus, Gaius** (75?–160 A.D.), Rom. historian, **1967.**
**Suevi** (*swē'vī*) or **Suebi,** anc. Germanic people, **1195, 3303.**
**Suez** (*sụ-ĕz'*), Egypt. port on Red Sea at s. end Suez Canal; pop. 31,000; **3384.**
**Suez Canal,** connecting Mediterranean and Red Sea, **3384, 626;** Gt. Brit. obtains control, **3384, 1013, 1222;** attacked in World War, **3795.**
**Suf'fixes,** in English, **1162.**
**Suffolk** (*sŭf'ōk*). Eng. county on e. coast; 1489 sq. mi.; pop. 400,000; divided into E. and W. Suffolk; agriculture.
**Suffrage,** 3384–5; and citizenship, **768;** granted to negroes in U.S., **780;** women, **3777–9.** *See also in Index* **Women's rights.**
**Suffragettes,** 3779.
**Sufi** (*sụ'fē*) **dynasty,** Persia, **2738.**
**Sug'ar,** 3385–9; chemistry of sugars, **3388–9;** clarified by bone-black, **688;** contains carbon, **642;** fermentation, **84;** as food, **1320–2, 3388;** formed by leaves, **1980;** glucose a substitute, **1475;** high percentage in raisins, **2974;** introduced into Europe, **932;** maple, **2138–42;** minimum which taste can detect, **3513;** polarized light rotated by solution, **2000;** refining, **3386–8, 515;** resembles starch, **3344.**
*Centers of production,* **3385;** Barbados, **329;** Bolivia, **449;** Brazil, **495;** Cuba, **936, 937;** Hawaiian Isls., **1603;** India, **382, 1751;** Louisiana, **2068, 2071;** Porto Rico, **2885, 2886.**
*See also in Index* **Beet, sugar.**
**Sugar Act,** British (1764), **3000–1.**
**Sugar beet.** *See in Index* **Beet, sugar.**
**Sugar Loaf,** Rio de Janeiro, **3020,** *picture,* **3284.**
**Sugar maple,** 2138.
**Suggestion,** in psychology, the causing of an idea or action on the part of one person through the introduction of an idea by a second person; use in hypnotism, **1717–8.**
**Suite** (*swēt*), in music, **2378–9.**
**Suleiman.** Same as **Solyman.**
**Sul'la, Lucius Cornelius** (138–78 B.C.), Rom. general; conquered Mithridates (84); died as dictator, extinguishing Marian party in bloody proscriptions; **3046.**
**Sullivan, Anne Mansfield** (Mrs. John A. Macy), Amer. teacher, **1916.**
**Sullivan, Sir Arthur Seymour** (1842–1900), Eng. composer of both popular and artistic standing, develops comic opera, **2584;** chief works, **2381.**

**Sully, Maximilien de Béthune, Duc de** (1560–1641), Fr. statesman and financier, great minister of Henry IV, **1637.**
**Sully, Thomas** (1783–1872), Amer. portrait painter, b. England ('Decatur'; 'Lafayette'; 'Jefferson'), **2634.**
**Sully's Hill Park,** N.D., small national park in n.e.; wild animal preserve, **2400.**
**Sulphate** (*sŭl'fāt*), a salt of sulphuric acid; of aluminum and potassium (alum), **104, 3390;** ammonia, as fertilizer, **118;** ammonium, **118, 1235;** bacteria make, **303;** of calcium, **1554;** copper (blue vitriol), **3390;** iron (green vitriol or copperas), **3390, 1779;** potassium, **1235;** sodium, **3272.**
**Sul'phide,** a compound of sulphur with an element or another compound; of hydrogen, **3389;** iron, **712;** lead, **1974;** mercury, **2200, 2642.**
**Sul'phite,** a salt of sulphurous acid; sulphite process in paper-making, **2668,** *picture,* **2669.**
**Sulphur** (*sŭl'fûr*), a chemical element, **3389–90, 4042;** dioxide, **3390, 151;** experiment with, **712;** fumes, poisonous, **2855, 3657;** in gunpowder, **1552–3;** in Japan, **1868;** Louisiana, **2070,** *picture,* **2069;** melting point, **1362;** from Mt. Etna, **1185;** in protoplasm, **394;** in vulcanizing rubber, **3072, 3076.** *See in Index* **Disulphide; Sulphate; Sulphide; Sulphite; Sulphuric acid; Sulphurous acid.**
**Sulphur-bottom whale, 3726.**
**Sulphur butterflies,** color plate, **548–9.**
**Sul'phuretted hydrogen, 3389.**
**Sulphu'ric acid, 3390;** characteristics as acid, **8, 10;** in making glucose, **1475;** in making nitric acid, **2510, 2511;** in nitroglycerin manufacture, **1050;** in Leblanc sodium process, **3272.**
**Sul'phurous acid,** an unstable compound ($H_2SO_3$) assumed to exist but never isolated because of decomposition into sulphur dioxide ($SO_2$) and water; used in making isinglass, **1409.**
**Sultana** (*sŭl-tä'nà*) **raisins, 2974.**
**Sulu** (*sụ-lụ'*) or **Jolo Islands,** group of isls. forming s.w. portion of Philippine Archipelago; *map,* **1072;** Moros in, **2766;** pearl fisheries, **2703.**
**Sumach** (*shụ'măk*), any of several small trees or shrubs with feathery leaves, **3390–1;** leaves used in tanning, **1976;** poison dogwood, **2852;** poison ivy, **2852, 1854;** poison oak, **2852.**
**Sumatra** (*sụ-mä'trà*), Dutch E. Indies, 3d largest isl. of Malay Archipelago; 167,000 sq. mi.; pop. 4,000,000; **3391, 1072,** *maps,* **2624–5, 232–3, 1072;** coffee, **823, 824;** orang-utan, **2590.**
**Sumer** (*sū'mēr*). Anc. name of Babylonia, used in cuneiform inscriptions together with "Akkad," each probably referring to whole country.
**Sume'rians,** predecessors of Babylonians in Tigris-Euphrates valley, **295;** cuneiform writing, **939;** eagle symbol, **1053;** phalanx, *picture,* **297;** engraved seals, **1410.**
**Sumida** (*sụ'mē-dà*) **River,** Japan, **3511,** *picture,* **1875.**
**Summer,** how caused, *picture,* **1063;** solstice, **1173.**
**Summerall, Charles P.** (born 1867). Major-general, U.S. Army; b. Lake City, Fla.; graduated U.S. Military Academy 1892; in Philippines and China 1899–1901; commander artillery brigade, 42d Division, and First Division, A.E.F., 1917–18; commanded First Division July 17—Oct. 11, 1918; commanded 5th Army Corps, Oct. 12, 1918—Feb. 28, 1919.
**Summerland,** Calif., town on coast 6 mi. s.e. of Santa Barbara; oil wells, *picture,* **2753.**
**Summer roses, 3066.**
**Summer solstice, 1173,** *picture,* **1063.**
**Summer squash, 3333.**
**Summit,** N.J. Residential city 21 mi. w. of New York City, attractively situated in Orange Mts.; pop. 10,174; silk, roses.
**Sumner, Charles** (1811–74), Amer. statesman, **3391–2.**
**Sumter, Thomas** (1734–1832), Amer. Rev. general, b. Hanover County, Va.; representative in Congress 1789–93, 1797–1801; U.S. senator 1801–09, 1811–17; raids against British, **3004;** gives name to Ft. Sumter, **1332.**
**Sumter,** S.C. Town 40 mi. e. of Columbia; pop. 9508; makes lumber and machinery.
**Sumter, Fort.** *See in Index* **Fort Sumter.**
**Sun, 3392–5, 240;** analyzed by spectroscope, **3311;** Copernican theory, **880;** eclipse, **1074,** *picture,* **1075;** heat given off, **1619, 1620;** immensity of, **242–3;** latitude determined by, **2420;** origin of, **2433, 2819;** Phaethon myth, **2759;** photographing the sun, **2552;** size, *picture,* **2321;** probable temperature, **1618;** ultimate source of all life energy, **394, 1149;** passage through zodiac, **3840.** *See in Index* **Solar system; Sun worship.**
**Sunbury,** Pa. Borough on Susquehanna R. 45 mi. n. of Harrisburg; pop. 15,721; r.r. shops, silk and planing mills, dye works; site of Ft. Augusta, built during French and Indian War (1756).
**Sun'da Islands.** Group in E. Indies extending from Malay Peninsula to the Moluccas; includes Sumatra, Java, Borneo, Celebes, and adjacent smaller isls.
**Sunda Strait,** between Sumatra and Java, *map,* **1072–3.**
**Sunday, William Ashley** or **"Billy"** (born 1863). Amer. evangelist; former professional baseball player; b. Ames, Iowa.
**Sunday,** the Christian Sabbath, **3103;** meaning of name, **969.**
**Sunday schools, 3395–6.**
**Sun'derland,** England. Seaport on n.e. coast at mouth of Wear R.; pop. 156,000; great coal-shipping port; shipbuilding.
**Sundese,** Malayan language. **1879.**
**Sundew,** a carnivorous plant, **3396, 1305–6.**
**Sundial,** device for measuring time, *pictures,* **799, 478;** invented by Babylonians, **797.**
**Sunfish, 3396, 1279.**
**Sunflower,** a large plant of the aster family, **3396–7;** as silage, **3240;** structure of flowers, **1305.**
**Sunflower State, 1909.**
**Sungari** (*sụn-gä-rē'*) **River,** Manchuria, tributary of the Amur; 800 mi. long; *map,* **740;** Harbin on, **2135.**
**Sung** (*sụng*) **dynasty** (960–1280), one of the great Chinese dynasties under which arts and letters flourished; porcelain, *picture,* **2882.**
**Su'nium,** promontory of s.e. Attica, Greece; modern Cape Colonna; **11.**
**Sun** or **solar motor, 3392, 3394.**
**Sun'na,** or divine law of Mohammedans, **3560.**
**Sun'nites,** members of the orthodox Mohammedan sect, predominating in Arabia and Turkey, **2278.**
**Sunset, 3570, 52,** *picture,* **1999.**
**Sunshine State, 3347.**
**Sunspots, 3395,** *picture,* **3393.**
**Sunstroke,** or heat exhaustion, first aid, **1270.**
**Sun worship, 1250;** cliff dwellers' temple, *picture,* **794;** in anc. Egypt, **1106;** Incas, **3392;** Zoroastrians, **3841–2.**
**Sun Yat Sen** (born 1867). Chinese revolutionary leader; chosen provisional president of Chinese Republic 1911; resigned 1912 in favor of Yuan Shih-Kai; elected president 1921 by Southern Parliament and led military campaign against Peking.
**Superior,** Wis., one of 2 most westerly ports of Great Lakes, at head of L. Superior opposite Duluth, Minn.; pop. 39,671; 3 connecting harbors; **3772, 3397, 1513.**
**Superior, Lake,** most northern of Great Lakes; largest body of fresh water in the world; 31,200 sq. mi.; **3397, 1510–4,** *map,* **1511;** commerce, **1047;** copper and iron deposits, **881, 882, 883, 2254, 1418;** Soo canals, **3129–30.**
**Super-steel,** an alloy, **99.**
**Superstitions, 2117–20;** comets, **849;** dragon-fly, **1028;** eclipse, **1074;** ginseng, **1460;** Hallowe'en, **1566;** hazel twig, **1611;** horoscopes, **2815, 3840;** Indian medicine-men, **1771;** Maori, *picture,* **2499;** mistletoe, **2274;** mushrooms, **2374;** Pacific islanders, **2621;** peacock plumes, **1229;** petrel, **2747;** porcelain vessels, **2881;** sea serpent, **3169;** snakes, **3257, 816;** stork, **3362;** tarantula, **3436;** warts, **3673, 3506;** whirlpools, **3733;** will-o'-the-wisp, **3742.** *See also in Index* **Fairies; Folk-lore; Magic.**
**Supply and demand,** law of, **1077.**
**Suprare'nal gland,** above kidney, **1469, 1470.**
**Supreme Court, U.S., 909;** duties defined by Constitution, **3594;** and John Marshall, **2154, 2155;** Taft, chief justice, **3429.**
**Sur,** Syrian town; pop. 5000; **2774.**
**Surabaya** (*sụ-rä-bä'yä*) or **Soerabaya.** Largest city of Java, naval and military headquarters of Dutch E. Indies; pop. 160,000.
**Suraj-ud-Dowlah** (*sụ-räj'-ụd-dou'lä*) (d. 1757), nawab of Bengal, who perpetrated the Black Hole massacre, **573, 796.**
**Surat** (*sụ-rät'*). India. Seaport 160 mi. n. of Bombay; pop. 115,000; great trade center 16th to 18th cents.
**Surface, Joseph.** In Sheridan's 'School for Scandal', an artful malicious hypocrite.
**Surface measure, 3715.**
**Surface tension,** in liquids, **3267–8;** applied in new water-pump, **3694.**
**Surf-bird,** a plover-like shore-bird, **3414.**
**Surf-riding,** *picture,* **1603.**
**Sur'gery.** *See in Index* **Medicine and surgery.**
**Surgery, plant, 3532, 1377, 1379.**
**Surinam'.** *See in Index* **Dutch Guiana.**
**Surren'tum** *See in Index* **Sorrento.**
**Sur'rey, Henry Howard, Earl of** (1518?–47). Eng. poet, soldier, and courtier who introduced blank verse into England, and, with Wyatt, the sonnet; beheaded on trumped-up charge of treason.
**Surrey.** Agricultural county in s.e. England bordered on n by Thames and adjoining London; 758 sq. mi.; pop. 930,000; many London business men have their homes here.
**Survey'ing, 3397–8;** compass used, **854;** geological, **3600–1;** maps and mapping, **2142–3;** ocean bed, **2554, 2556;** pendulums to determine latitude and altitude, **2715;** public lands, **1960;** for railroad routes, **2964;** township as unit, **3521.**
**"Survival of the fittest,"** in biology, **1210;** birth of Darwin's idea, **964.** *See in Index* **"Struggle for existence."**
**Sus** (*sụs*), a genus of pig-like animals; domestic hogs, **1671;** wild boars, **440.**
**Su'sa,** anc. city (biblical Shushan) of w. Persia near Shuster; excavations of ruins have revealed many interesting objects; **2734;** taken by Alexander, **87.**
**Susa,** seaport in Tunis; pop. 27,000; **3550.**
**Susiana.** *See in Index* **Elam.**
**Suspen'sion bridges, 505–6,** *pictures,* **503, 2490.**

**Susquehanna** (*sŭs-kwē-hăn'ȧ*), r. rising in L. Otsego, N.Y., and flowing 500 mi. s. through Pennsylvania to Chesapeake Bay, **2721, 2485, 1591,** *map,* **2718.**
**Susquehanna University.** Luth. co-ed. institution at Selinsgrove, Pa.; founded 1858 as Missionary Institute, chartered as univ. 1894; liberal arts, theology.
**Sus'sex,** a county in s.e. England on the Channel; 1459 sq. mi.; pop. 728,000; watering places; famous for sheep raised on the Down lands; historic interest, **1160.**
**'Sussex',** Brit. ship sunk in World War, **3799.**
**Sussex sheep,** *picture,* **3199.**
**Sut'lej** or **Satlej,** river of n.w. India; largest of "five rivers" which give name to Punjab; rises in Tibet and flows 1000 mi. to Indus; *map,* **1744.**
**Su'tras,** Hindu poems, **1755.**
**Suttee',** **1751.**
**Sutter, John A.** (1803–80), California pioneer on whose land first gold was discovered in 1848; overrun by prospectors, was financially ruined; **3103.**
**Suttner, Bertha, Baroness von** (1843–1914), Austrian author and peace advocate, **2513.**
**Suva** (*sū'vä*), cap. of Fiji Islands, **1239.**
**Suwanee** (*sų-wä'nē*) **River,** stream flowing from Okefinokee Swamp in s. Georgia 240 mi. through Florida to Gulf of Mexico; celebrated in song 'Old Folks at Home'; *map,* **1298.**
**Svealand** (*svā'ȧ-länd*), province of Sweden, **3402.**
**Svengali** (*svĕn-gä'lī*). In Du Maurier's 'Trilby', hypnotist who makes Trilby a great singer.
**Swabia** (*swā'bī-ȧ*), medieval duchy of s.w. Germany; flourished under Hohenstaufens; disintegrated into small states 1268; great Swabian League for mutual protection (1488–1534); now name of Bavarian province; **1441, 1447;** ancestral home of Hohenstaufens and Hohenzollerns, **1672;** Peasants' War, **2987, 1448;** Rom. wall, **1446.**
**Swahili** (*swä-hē'lī*), an African people of Bantu stock, with some mixture of Semites; they are Mohammedans and are noted as traders; number about 1,000,000; **1068.**
**Swallow,** a long-winged, fork-tailed bird, **3398–9;** altitude range, *picture,* **397;** barn swallow, *picture,* **419;** nest, **407.**
**Swallow, sea.** Same as **Tern.**
**Swallow-tail butterfly,** color plate facing **548.**
**Swamp,** low land saturated with water; cypress, *picture,* **946;** dried by eucalyptus trees, **1186–7;** reclamation in U.S., **1828;** typical vegetation, **3700.**
**"Swamp Fox," 2149.**
**Swamp mahogany,** a eucalyptus, **1187.**
**Swamp rose, 3066.**
**Swamp** or **poison sumac, 2852.**
**Swan,** a large goose-like bird, **3399–3400;** head, *picture,* **410;** length of life, **126.**
**Swan Falls,** of Snake R. in s. Idaho, **1725.**
**Swan-goose, 1488.**
**Swan River,** w. Australia. A short river rising as the Avon; flows n.w. entering Indian Ocean 12 mi. below Perth; gave name to first colonial settlement in w. Australia, founded 1829.
**Swansea** (*swąn'sē*), leading seaport in S. Wales, on Bristol Channel; pop. 168,000; copper-smelting center, tinplate trade; **3664.**
**Swan-song, 3400.**
**Swarming,** of bees, **362;** of locusts, **1504, 1506.**
**Swarthmore,** Pa. Town 10 mi. s.w. of Philadelphia; pop. 2350; Swarthmore College.
**Swarthmore College.** Non-sect. co-ed. institution at Swarthmore, Pa.; founded 1864 by Society of Friends (opened 1869); arts and sciences, engineering.
**Swastika** (*swäs'tĭ-kȧ*), sign of good luck, **3078, 206.**
**Swatow** (*swä-tow'*). Treaty port in province of Kwangtung, s.e. China, on Han R. near mouth; pop. 85,000; chief export, sugar.
**Swaziland** (*swä'zĭ-länd*), Brit. protectorate in S. Africa at s.e. corner of Transvaal; 6678 sq. mi.; pop. 135,000; exports tin; cap. Mbabane; *maps,* **40–1;** sheep-raising, **3283.**
**Sweat gland, 3246.**
**Sweatshop system, 3400, 805–6.**
**Swe'den,** country of n. Europe, occupying the e. part of Scandinavian peninsula; 173,035 sq. mi.; pop. 6,000,000; **3401–5,** *maps,* **1196–7, 2531;** agriculture, **3404, 2900;** cap. Stockholm, **3357–8;** climate, **3402–3;** coöperative movement, **879;** education, **3404, 3358;** elevation, *map,* **1190–1;** fisheries, **3402, 3404, 1285;** foreign trade, **3403, 3404, 1820;** forests and forest products, **3403, 3404;** language and literature, **3134;** Lapland, **1962;** manufactures, **3404, 3358;** merchant marine, **3402, 3219;** Mid-summer Day, **3401, 3357;** minerals, **3402, 3404;** physical features, **3401, 3402–3;** population, **3401, 3404,** *map,* **1190–1;** rainfall, *map,* **1190–1;** skiing, **3754;** vegetation, *map,* **1190–1.**
*History,* **3404–5;** Northmen, **2525–8;** Finland conquered, **1248;** Union of Kalmar, **997;** Gustavus Adolphus, **1553–4, 3488–9;** in 17th cent., **1195;** settlements in N. Amer., **989, 2461;** Charles XII and Great Northern War, **698, 2747;** in Seven Years' War, **3180;** "Hats and Caps," **1598;** in Napoleonic Wars, **2394, 2395;** union with Norway dissolved, **2536.**

**RULERS OF SWEDEN (FROM 1523)**

HOUSE OF VASA

| | |
|---|---|
| 1523-60 | Gustavus I, Vasa |
| 1560-69 | Eric XIV |
| 1569-92 | John III |
| 1592-1604 | Sigismund III |
| 1604-11 | Charles IX |
| 1611-32 | Gustavus II Adolphus |
| 1632-54 | Christina |

HOUSE OF PFALTZ

| | |
|---|---|
| 1654-60 | Charles X |
| 1660-97 | Charles XI |
| 1697-1718 | Charles XII |
| 1718-20 | Ulrica Eleanora |

HOUSE OF HESSE

| | |
|---|---|
| 1720-51 | Frederick I |

HOUSE OF HOLSTEIN-GOTTORP

| | |
|---|---|
| 1751-71 | Adolphus Frederick |
| 1771-92 | Gustavus III |
| 1792-1809 | Gustavus IV |
| 1809-18 | Charles XIII |

HOUSE OF PONTE CORVO

| | |
|---|---|
| 1818-44 | Charles XIV (John) |
| 1844-59 | Oscar I |
| 1859-72 | Charles XV |
| 1872-1907 | Oscar II |
| 1907- | Gustavus V |

**Swedenborg** (*swē'dĕn-bôrg*), **Emanuel** (1688–1772). Swedish scientist, philosopher, and religious mystic; theological writings, expounding Bible and universe, form basis of New Church or New Jerusalem Church, popularly called Swedenborgianism.
**Swedish clover, 810.**
**Swedish mile, 3715.**
**"Swedish nightingale."** *See in Index* **Lind, Jenny.**
**Swedish turnip, 554.**
**Sweet alys'sum,** flowering plant of cabbage family, **554.**
**Sweetbread** or **pancreas, 1469.**
**Sweet Briar College.** At Sweet Briar, Va.; established 1901; women, non-sectarian; arts and science.
**Sweetbrier rose, 3066.**
**Sweet clover, 809, 810.**
**Sweet corn, 890;** when and how to plant, **1397.**
**Sweet-flag.** Same as **Calamus.**
**Sweet gum** or **liquidambar,** a tall tree of the witch-hazel family; exudes a resinous gum; classified as polypetalous, **3533.**
**Sweet laurel, 1970.**
**Sweet pea, 3405.**
**Sweet potato, 3405–6, 2902;** food value, **1322;** when and how to plant, **1397.**
**Sweet-potato squash, 3333.**
**Sweet Springs,** Mo., **2269.**
**Sweetwater River,** crosses Rocky Mts. in s. center of Wyoming and enters n. fork of Platte R.; 180 mi. long; *map,* **3620;** gold discovered, **3822.**
**Sweet-william,** a phlox, **2773.**
**Sweet-william,** a pink, **2809.**
**Sweyn** (*swān*) **Forkbeard** (d. 1014), king of Denmark; ravaged England yearly after massacre of Danes, St. Brice's Day 1002; father of Canute the Great; **639.**
**Swift, Jonathan** (1667–1745), Eng. satirist, **3406, 1165, 1166;** story, 'Gulliver's Visit to Lilliput and Other Lands', **3407–10.**
**Swift,** a lizard, **2038.**
**Swift,** an insect-eating bird, **3398–9,** *pictures,* **416, 3399.**
**Swim'merets,** of crawfish, **916,** *picture,* **915;** lobster, **2041.**
**Swimming, 3410–2;** water polo, **2873.**
**Swimming crab,** *picture,* **913.**
**Swin'burne, Algernon Charles** (1837–1909). Eng. poet; a passionate rebel, by temperament rather than conviction; master of "new, astonishing melodies"; revolutionized Eng. lyric prosody ('Atalanta in Calydon'; 'Songs before Sunrise'; 'Poems and Ballads').
**Swin'don,** England. Market and r.r. town 72 mi. w. of London; pop. 54,000; large locomotive and car works; old town is the "Svindune" of Domesday.
**Swine.** *See in Index* **Hog.**
**Swiss chard,** a type of beet, **365.**
**Swiss cheese, 709, 3415, 3416.**
**Swiss Guards,** famous bodyguard of Fr. kings, organized 1616, **3158.** Name is also given to the bodyguard of the popes.
**Swiss Mondaine,** a pigeon, *picture,* **2805.**
**Swissvale,** Pa. Mfg. borough, suburb of Pittsburgh; pop. 10,908.
**Switchboard,** telephone, **3459–60,** *pictures,* **3461.**
**Switchyard, 2970–1.**
**Swit'zerland,** small mountainous country of Europe; area, 15,950 sq. mi.; pop. 3,850,000; cap. Berne; **3412–21,** *maps,* **1196–7, 3415;** Alps, **3413–4, 101–2, 3417–21, 1189;** army, **3416, 218;** cheese, **709, 1477;** chief cities, **386–7, 1411–2, 3842, 3415, 3416;** elevation, *map,* **1190–1;** folk-songs, **1318;** glaciers, **3417–21;** government, **3416, 1778, 1779;** Jura Mts., **1903;** manufactures, **3416, 386–7, 3842, 3522, 3235, 3236;** population, **3415,** *map,* **1190–1;** rainfall, *map,* **1190–1;** rivers, **3413–4, 3012;** vegetation, *map,* **1190–1;** winter sports, **3416, 3754, 3756.**
*History,* **3414–5;** legend of Tell, **3463–5;** confederacy founded, **3464;** battle of Sempach, **3752;** war with Burgundy, **697;** independence confirmed, **3489;** Reformation, **587, 3842.**
**Swiv'eller, Dick.** A roistering, good-natured, happy-go-lucky spendthrift in Dickens' 'The Old Curiosity Shop'; marries the Marchioness.
**Sword, 3422–3;** of Bronze Age, *picture,* **515;** Damascus, **956,** *picture,* **957;** used in knighting, **1934.**
**Sword, Knights of the, 932.**
**Swordfish,** a long-snouted, mackerel-like fish, **3423,** *picture,* **1274;** confused with sawfish, **3131.**
**Sword-lily** or **gladiolus, 1466.**

**Sword of Damocles, 957.**
**Syb'aris.** Anc. city of s. Italy, proverbial for luxury (hence "sybarite"); destroyed 510 B.C.
**Sycamore** (*sĭk'ȧ-mōr*), a tree, **3424.**
**Syd'ney,** New South Wales, chief city of Australia; pop. 780,000; **3424, 267;** climate, **2471.**
**Sydney,** Nova Scotia, chief port of Cape Breton Isl.; pop. 23,000; **640.**
**Sydney, University of, 2471,** *picture,* **268.**
**Syene** (*sī-ē'nē*). *See in Index* **Assuan.**
**Sylves'ter II,** pope 999–1003, tutor to Otto III, **2606.**
**Sylviidae** (*sĭl-vĭ'i-dē*), bird family of kinglets and gnat-catchers, **1926, 412,** *picture,* **420;** includes nightingale, **2509.**
**Syl'vius, Aeneas** (Pius II), **2813, 811.**
**Symbiosis** (*sĭm-bī-ō'sis*), in biology, partnership between dissimilar plants or animals, **1994, 2680, 3936;** crab partnership with mussel and anemone, **912, 914;** blueberry and fungus, **439;** legumes and bacteria, **2830.**
**Symonds** (*sĭm'ȯndz*). **John Addington** (1840–93), Eng. critic, author of the monumental 'History of the Renaissance in Italy' and many other valuable works; quoted, **2996.**
**Symons, Arthur** (born 1865). Eng. critic and poet; greatly influenced by Fr. literature, especially the Symbolist school ('The Symbolist Movement in Literature'; 'Studies in Seven Arts').
**Sympathetic ink, 1779, 816.**
**Sympathetic nerves, 2437, 1617.**
**Sympet'alous flowers,** in botany, **3939.**
**Symphony** (*sĭm'fō-nĭ*), musical composition, **2379;** Beethoven develops, **366.**
**Syncar'pous flowers, 3939.**
**Syn'cline,** a fold of rock with the point down, *picture,* **2751.**
**Syn'dicalism,** a labor movement, **1947.**
**Syn'dicate,** in finance, **3359.**
**Synge** (*sĭng*), **John M.** (1871–1909), Irish playwright, **1814, 1036;** chief plays, **1038.**
**'Synnöve Solbakken',** novel by Björnson, **432.**
**Synod'ic** or **lunar month, 2317.**
**Synthet'ic chemistry, 714.**
**Synthetic method,** in geometry, **1427.**
**Synthetic products,** artificially made compounds; camphor made from turpentine, **594;** from coal-tar, **814, 816;** drugs, **1042;** dyes, **1050;** gems, **1410;** indigo, **1777;** perfumes, **2729;** plastic materials, **673, 814.**
**Syracuse** (*sĭr'ȧ-kūs*). N.Y., mfg. city near Onondaga L., N.Y.; pop. 171,-717; **3425.**
**Syracuse,** anc. city on s.e. coast of Sicily; founded by Corinthians 734 B.C.; destroys Etruscan fleet, **3044;** Athenian expedition against (415–413 B.C.), **1524;** Pyrrhus aids, **2941;** taken by Rome (212 B.C.), **175;** modern city (pop. 44,000), **3230.**
**Syracuse University,** at Syracuse, N.Y.; chartered 1870; co-ed., nonsect.; liberal arts, medicine, fine arts, law, engineering, forestry, agriculture, teachers' college, library school, graduate school; **3425.**
**Syr-Darya** (*sĭr-dä'rĭ-ä*), a great r. (anc. Jaxartes) of cent. Asia flowing 1500 mi. from the Tien-Shan range to the Sea of Aral; much of its water is drained away for irrigation; *map,* **232–3.**
**Syria** (*sĭr'ĭ-ȧ*), a region in w. Asia bordering the Mediterranean; 114,-000 sq. mi.; pop. 3,000,000; also, in limited sense, an independent state (60,000 sq. mi.) established 1920 under Fr. mandate; **3425–6,** *map,* **232–3;** Damascus, **954–7;** rug-making, **3077.** —*History,* **3426;** chief events summarized, **1655–7;** early history, **297;** Phoenicians in, **2774;** Egyptian conquests, **1105, 1106, 1107;** relations with Judea, **1891;** Crusades, **929–32;** Saladin, **3112;** Assassins in, **236;** World War and after, **3807, 3812.** *See also in Index* **Palestine.**
**Syringa** (*sĭ-rĭn'gȧ*), the lilac genus of shrubs, **2008, 3426.**
**Syringa** or **mock-orange,** a shrub of the saxifrage family, **3426.**
**Syrinx** (*sĭr'ĭnks*), in Gk. myth., maiden loved by Pan, **2376.**
**Syrinx** or **pipes of Pan, 2376, 3781.**
**Syrinx,** the vocal structure in singing birds, **405.**
**Syrup,** corn, **1475, 890;** maple, **2138–42;** sorghum, **3276.**
**Systematic zoölogy, 3841.**
**System'ic circulation,** of blood, **438.**
**Szechwan** (*sā-chwän'*). Province of w. China; 218,480 sq. mi.; pop. 54,-500,000; cap. Chengtu; cereals, sugar, tobacco, silk, coal, iron, salt.
**Szegedin** (*sĕ'gĕ-dēn*) or **Szeg'ed.** The 2d city of Hungary; commercial center on Theiss R. 100 mi. s.e. of Budapest; pop. 119,000.
**Szeklers** (*sĕk'lĕrs*), a people of Rumania, **3081.**

# T

THE original form of T in the Egyptian hieroglyphics ) is the picture of a noose or a lasso, or, as some scholars think, that of a tongue. The Phoenicians made it in the form of a cross X + with the four arms of equal length. They and the Hebrews used it as a sign for marking the ownership of animals and for other identification purposes. It is this kind of mark that is probably referred to in Ezekiel ix, 4. The early Greeks moved the horizontal to the top and so made the T we have today. If you examine the small form of the letter as we have it in our printed books today, you will notice a little dark spot in the upper left angle. This spot has a curious origin. It shows that as originally written in the old manuscripts, the T was not crossed after the vertical had been formed, but the horizontal bar was made first (from right to left) and the vertical stroke added without taking the pen off the paper. This, you see, would tend to make a little blot in the place where we have it today. Try it with a pen.

**Taal** (*täl*), volcano on Luzon Isl., Philippines; crater 7650 ft. across; **2764.**

**Tab'ard Inn, 701,** *picture,* **705.**

**Tabasco** (*tä-bäs'kō*), Mexico, state in n. of Isthmus of Tehuantepec, on Gulf of Mexico; 10,374 sq. mi.; pop. 194,000; oil field, **2211, 2212.**

**Tabasco pepper, 2723.**

**Tabernacle** ("tent"). Tentlike portable structure erected by Israelites in wilderness as place of worship; name later applied to the Temple, and hence to other houses of worship, as Mormon Tabernacle at Salt Lake City.

**Tabernacles, Feast of.** Annual autumn harvest festival of the Jews, commemorating dwelling in tents in the wilderness.

**Tabira** (*tä-bē-rä'*), prehistoric ruins in cent. New Mexico, **2467.**

**Tab'itha.** Same as **Dorcas.**

**Table Bay,** harbor of Cape Town, S. Africa, **640, 3279.**

**Table Mountain,** near Cape Town, S. Africa, **640,** *picture,* **3279.**

**Ta'bor, Mt.** (Jebel Et-Tûr). Famous mt. of Palestine, 8 mi. e. of Nazareth; height 1840 ft.

**Tabriz** (*tä-brēz'*), 2d city of Persia, in extreme n.w.; pop. 200,000; repeatedly devastated by earthquakes; occupied by Turks and then by Russians during World War; commercial importance, **2734.**

**Tabu** (*tä-bụ'*) or **taboo,** among primitive races, the sacred prohibition of certain acts or the use of certain things, **2118, 2621.**

**Tachina** (*tä-kī'nȧ*) **flies,** parasitic flies that lay their eggs on the backs of caterpillars, **218.**

**Tachometer** (*tȧ-kŏm'ĕ-tēr*), airplane speed-indicator, **66.**

**Tacitus** (*tăs'ĭ-tŭs*), **Cornelius** (55?–120? A.D.), Rom. historian, great Latin stylist, concise and epigrammatic, **1967, 1435, 1446.**

**Tack,** a small nail, **2388.**

**Tacna-Arica** (*täk'nä-ä-rē'kä*), provinces of n. Chile containing rich nitrate beds, **738, 2744.**

**Taco'ma,** Wash., 3d city of state, seaport on Puget Sound; pop. 96,965; **3427, 3688.**

**Tacoma, Mt.** *See in Index* **Rainier.**

**Tacon'ics,** low mt. range on borders of New York and Massachusetts; joins Green Mts. of Vermont with the Hudson Highlands; in Massachusetts called Berkshire Hills; **3632.**

**Tac'tile papillae, 3246.**

**Tad'mor,** biblical name for Palmyra, **2648.**

**Tadpoles,** the fish-like young of amphibians, **1373–4;** of salamander, **3112;** of toads, **3507.**

**Taf'feta.** A somewhat general term used for plain smooth silk with a luster or for silk woven in lines so fine as to appear plain woven; in the 16th cent. it applied to a heavy costly dress fabric and later to a soft thin silk.

**Taff'rail log, 2045,** *picture,* **2046.**

**Taft, Alphonso** (1810–91), father of William H., **3427.**

**Taft, Lorado** (born 1860), Amer. sculptor, b. Elmwood, Ill. ('Columbus Memorial Fountain'; 'Solitude of the Soul'; 'Fountain of Time'); and author ('History of American Sculpture'; 'Modern Tendencies'); influence on Amer. art, **3164;** 'The Blind', *picture,* **3163;** 'Fountain of Time', *picture,* **723.**

**Taft, William Howard** (born 1857), 27th president of U.S., **3427–9;** early life, **3427–9;** gov. of Philippines, **3428;** relations with Roosevelt, **3062;** becomes chief justice, **3429.** —*Administration,* **3428–9;** Payne-Aldrich tariff, **3437;** Panama Tolls Bill enacted, **3746;** 16th amendment adopted, **3441;** Progressive party formed, **3429, 3062;** Wilson, elected president, **3744, 3746, 3429.**

**Tagalogs** (*tä-gä'lōgz*). The dominant people of the Philippines, inhabiting chiefly cent. Luzon. They are Christians and lead the other races in intelligence and culture.

**Tagliacozzo** (*täl-yä-kŏt'sō*), Italy. Small town 45 mi. n.e. of Rome; Charles of Anjou defeated Conradin of Hohenstaufen 1268.

**Tagore** (*tä-gōr'*), **Sir Rabindranath** (born 1861), Hindu poet, philosopher, and educator, **1756.**

**Tagua** (*tä'gwȧ*), the "vegetable ivory" palm, **1854, 2647;** in Ecuador, **1079;** made into buttons, **549–50.**

**Ta'gus,** largest r. in Spanish peninsula, 550 mi. long; flows across Spain, emptying into Atlantic at Lisbon, Portugal; **2026, 3300.**

**Tahiti** (*tä'hē-tē*) or **Otaheite,** largest of Society Isls. in s. Pacific; 600 sq. mi.; pop. 12,000; chief town Papeete; **2621;** native girl, *picture,* **2621.**

**Tahoe** (*tä'hō*), **Lake,** largest lake in Sierra Nevadas; on boundary between Calif. and Nev.; 20 mi. by 10; **2445,** *map,* **577.**

**Taihoku** (*tī-hŏ'kụ*), cap. of Formosa; pop. 108,000; **1332.**

**Tailings,** in flour milling, **1303.**

**Taille** (*tāl* or *tä'y*), old tax in France, **1366, 1178.**

**Tailor bird, 3429.**

**Tail-spin,** *picture,* **61.**

**Tainan** (*tī-năn'*). City in s. Formosa; pop. 54,000; cap. until 1896.

**'Táin Bó Cúalnge',** Irish epic, **1814.**

**Taine** (*tān*), **Hippolyte Adolphe** (1828–93), Fr. literary and art critic, philosopher, and historian; analyzed art and literature scientifically as products of race and environment; **1365.**

**Taiping** (*tī-pĭng'*) **Rebellion,** in China (1850–64), **749, 1489, 2389, 1574.**

**Tairen.** Same as **Dairen.**

**T'ai-Shan** (*tī-shän'*), sacred mt. of Shantung, **3195.**

**Taiwan** (*tī-wän'*). Same as **Formosa.**

**Taj Mahal** (*tȧzh mȧ-häl'*) ("gem of buildings"), beautiful tomb near Delhi, India, **3429–30,** *picture,* **3431.**

**Taklamakan,** desert in cent. Asia, **228, 739, 740.**

**Taku** (*tä-kụ'*), China, strongly fortified seaport guarding approach to Tientsin and Peking; captured by Brit. and Fr. fleets (1860) and by allied troops (1900) during Boxer uprising; **3498.**

**Talavera de la Reina** (*tä-lä-vä'rä dā lä rā'ē-nä*) (Rom. *Caesobriga*). Town of cent. Spain on R. Tagus; pop. 12,000; victory of Wellington over French under Joseph Bonaparte, 1809.

**Talc** (*tălk*), magnesium silicate, **3430;** called "French chalk," **685;** comparative softness, **2248.**

**Talca** (*täl'kä*), Chile. Cap. of province of Talca on Rio Claro, 170 mi. s. of Valparaiso; pop. 43,000; makes woolen blankets.

**Talcahuano** (*täl-kä-wä'nō*), Chile. Seaport and naval station on Bay of Concepcion, 8 mi. n.w. of Concepcion; pop. 25,000; important wheat exporting point.

**Tal'cum powder,** powdered talc, **3430.**

**Talent.** An anc. weight and denomination of money; Attic talent equal to about $1200; great Rom. talent about $500, small Rom. about $375, Hebraic, Assyrian, and Babylonian from $1550 to $2000.

**'Tale of Two Cities'.** Novel of the Fr. Rev. by Charles Dickens (1859), in which Sidney Carton takes the place of Charles Darnay on the scaffold, while Darnay flees to England with his family.

**'Tales from Shakespeare', 1958.**

**'Tales of Hoffman',** opera, **2584.**

**Tales the Woodman Told:** 'Adventures of Howler the Monkey', **2293–7;** 'Fleetfoot, the Deer', **982–5;** 'Johnny Bear', **351–4;** 'The Lynx with Wings', **2088–91;** 'Mogul, the Baby Elephant', **1128–32;** 'How the Mouse Grew So Small', **2360–2;** 'How Mr. Rabbit Lost His Tail',

**1586–8;** 'Why the Tortoise Bites So Hard', **3564–8;** 'How the Whale Learned to Smoke', **3727–9.**
**Talfourd** (*tal'fȯrd*), **Sir Thomas Noon** (1795–1854). Eng. lawyer and author, to whom Dickens dedicated 'Pickwick Papers' in recognition of his labors for a copyright law; defended Moxon against charge of blasphemy for publishing Shelley's 'Queen Mab'; edited Lamb's letters and wrote 'Ion', tragedy played with great success by Macready.
**Talien Wan** (*tä-lē-ĕn' wän*), bay on e. coast of Liaotung Peninsula, Manchuria; leased to Russia by China 1898; surrendered to Japan 1905.
**Tal'isman, 2118, 2120.**
**'Talisman, The',** novel, **3112.**
**Talking machine.** *See in Index* **Phonograph.**
**Tallade'ga,** Ala. Educational center 40 mi. e. of Birmingham; pop. 6546; Talladega College (colored); Synodical College for women; General Jackson defeated band of Creek Indians 1813.
**Tallahas'see,** Fla. Cap. of state, 158 mi. w. of Jacksonville; pop. 5637; cotton, tobacco, sugar cane, dairying, and stock-raising dist.; various mfrs.; State College for Women.
**Tallapoo'sa, battle of.** *See in Index* **Horseshoe Bend.**
**Tallapoosa River,** one of the confluents of the Alabama; 250 mi. long; *map,* **72.**
**Talleyrand-Périgord** (*tä-lā-rän'-pā-rē-gȯr'*), **Prince Charles Maurice de** (1754–1838), Fr. statesman, **3430, 3432;** X Y Z Affair, **3826.**
**Tallien** (*tä-lyän'*), **Jean Lambert** (1767–1820). Fr. Revolutionist, leading Terrorist; he was chiefly responsible for fall and execution of Robespierre.
**Tallinn,** Esthonia. Same as **Reval.**
**Tallow, 1227;** in oleomargarine, **2577–9;** in soap, **3267.**
**Tallow tree.** Tree of China, India, and other warm countries having seeds covered with greasy white substance used in making candles, soap, etc.; also butter or tallow tree of W. Africa yielding yellow greasy juice.
**Talma** (*tal-mä*), **François Joseph** (1763–1826). Fr. tragedian; introduced practice of dressing in costume appropriate to time and country of play.
**Talmage** (*tal'māj*), **Thomas DeWitt** (1832–1902). Amer. clergyman and pulpit orator, b. Bound Brook, N.J.; pastor of Brooklyn Tabernacle 1870–94; editor of *Christian Herald* after 1890; his sermons were published each week in hundreds of religious and secular papers.
**Tal'mud,** body of Jewish law, **1625;** readings at Passover, **2691;** advises vocational training, **3654.**
**Talon** (*tȧ-lôn'*), **Jean Baptiste** (1625–91). One of the ablest of the Fr. officials who governed New France; as intendant of justice and finance (1663–68, 1670–72) he encouraged trade and exploration of the west.
**Taman'dua** or **lesser ant-eater,** *picture,* **146.**
**Tamanend,** Delaware Indian chief, **3432.**
**Tama'qua,** Pa. Borough on Little Schuylkill R., 32 mi. n. of Reading; pop. 12,363; coal-mining interests, flour, foundry products, machinery, screens, clothing, lumber.
**Tam'arack,** the Amer. larch, **1963,** *picture,* **1962;** distinguished from other conifers, **3539;** not an evergreen, **1208;** in swamps, **3700.**
**Tam'arind,** a pod-bearing tropical tree, **3432, 1378.**
**Tamatave** (*tä-mä-tä'vä*), Madagascar; pop. 15,000; meat-preserving plant; r.r. to Antananarivo; **2106.**
**Tamaulipas** (*tä-mä-ų-lē'päs*), Mexico. State in n.e. on Gulf of Mexico; 30,831 sq. mi.; pop. 257,000; cap. Ciudad Victoria.
**Tambourine** (*tăm-bų-rēn'*), **1042,** *picture,* **2382.**
**Tambov** (*tăm-bȯf'*), Russia. Cap. of province of same name, 263 mi. s.e. of Moscow; pop. 72,000; founded 1636 as fortress to keep out Tatars; center of rich agricultural region.
**Tamerlane'.** Same as **Timur Leng.**
**Tam'ils,** a people of India, **1743, 685, 2130.**
**'Taming of the Shrew'.** One of the most popular of Shakespeare's comedies; Petruchio, the hero, tames Katherine, his shrewish wife; first published 1623 but probably written much earlier.
**Tam'many,** political organization of New York City, **3432;** Loco Foco meeting, **2871;** "Tweed ring," **2498;** opposes Woodrow Wilson's nomination, **3744.**
**Tammerfors** (*täm-ēr-fȯrs'*) or **Tampere.** Third city of Finland, 100 mi. n.w. of Helsingfors; pop. 47,000; water-power from nearby falls; cotton, paper, sawmills, and iron mills; locomotive works and shipyards.
**Tammuz** (*täm'mųz*). The Babylonian Adonis, for whom women worshipers wept yearly (Ezek. viii, 14).
**Tam O'Shanter.** In Burns's poem of that name, a drunken, good-natured farmer who, returning from a night of revelry, surprises a witches' dance and is pursued by them.
**Tam'pa,** Fla., commercial city, port, and winter resort on w. coast on inlet of Tampa Bay; pop. 51,608; cigars, ships, naval stores; ships phosphate, fruit, vegetables, sponges; **1300.**
**Tampa Bay,** Fla., harbor 35 mi. long; *map,* **1298;** De Soto christens, **999.**
**Tampico** (*tăm-pē'kō*), Mexico, seaport on Pánuco R. near Gulf of Mexico; pop. 36,000; in rich oil region; **2211, 2209;** "Tampico incident," **2217.**
**Tamworth,** England. Old town on borders of Staffordshire and Warwickshire, on R. Tame; interesting antiquities.
**Tana** (*tä'nä*), a r. of Kenya Colony, E. Africa, rising on Mt. Kenya; 500 mi. s.e. to Indian Ocean; *map,* **1069.**
**Tan'ager,** a bird, **3432;** food capacity, **402;** scarlet tanager, **410,** *picture,* **420.**
**Tanagra** (*tăn'ȧ-grȧ*), Greece. Anc. town of Boeotia; 457 B.C. Spartans defeated Athenians; famous necropolis with terra cotta statuettes (Tanagra figurines).
**Tananarivo** (*tä-nä-nä-rē'vō*), Madagascar. Same as **Antananarivo.**
**Tancho,** a Japanese crane, **3365.**
**Tancred** (*tăn'krĕd*) (d. 1112). Norman-Sicilian hero of the First Crusade, subsequently prince of Antioch; nephew of Robert Guiscard, cousin and companion-in-arms of Bohemond; portrayed by Tasso ('Jerusalem Delivered') as a brilliant, blameless hero.
**Taney** (*tą'nĭ*), **Roger Brooke** (1777–1864), Amer. jurist, b. Calvert County, Md.; chief justice U. S. 1836–64; rendered Dred Scott decision, **1039, 1858.**
**Tan'ga,** seaport of Tanganyika Territory, E. Africa; estimated pop. 8000 (100 white); r.r., **1069.**
**Tanganyika** (*tăn-gȧn-yē'kä*), **Lake,** in e.-cent. Africa, one of longest fresh-water lakes in the world; **3432–3, 36;** Livingstone, **2035.**
**Tanganyika Territory** (formerly Ger. E. Africa); 384,180 sq. mi.; pop. 7,700,000, mainly Bantus; **1069, 1068, 513,** *maps,* **1069, 40–1.**
**Tan'gent,** in geometry, a line which touches a circle or curve at only one point; problem, **1427.**
**Tangerine',** a kind of orange, **2590.**
**Tangier** (*tăn-ǧēr'*), chief seaport of Morocco, on Strait of Gibraltar; pop. 50,000; center of trade with Europe; street scene, *picture,* **2328.**
**Tanjore** (*tăn-jōr'*), India, literary and religious center 175 mi. s.w. of Madras in fertile dist. of Tanjore; pop. 60,000; cap. of anc. Hindu dynasty of Cholas; pagoda, *picture,* **1753;** rugs, **3079.**
**Tank** or **gasometer,** in gas works, **1406.**
**Tanks,** armored motor cars with mounted guns and caterpillar tractors, **3433, 217, 3791,** *picture,* **3794–5;** first extensive use, **3797;** first use of whippets, **3806.**
**Tan'nenberg,** village in E. Prussia, 85 mi. s. of Königsberg; center of Ger. line in World War battle by which Hindenburg stopped Rus. invasion (1914), **1650, 3794, 3810.**
**Tanner, Henry Ossawa** (born 1859). Amer. negro painter, b. Pittsburgh; pupil of J. P. Laurens and Constant ('Raising of Lazarus').
**Tannhäuser** (*tän'hoi-zēr*), knight in Ger. legend, **3433;** opera, **2584, 3663.**
**Tan'nin** or **tannic acid,** an amorphous solid acid, valuable in tanning, **1975–6;** in bricks, **784;** from eucalyptus, **1186;** in ink, **1779;** from mangrove, **2135;** in oak bark, **2548;** oak galls, **2548;** pomegranate, **2875;** tea, **3450.**
**Tanning, 1975–9;** in Egypt, **1097;** gloves, **1475.**
**Tansy,** tall herb of the aster family with bitter aromatic flavor; used for garnishing and flavoring; as a beverage, **3451.**
**Tan'tak** or **Tan'ta,** Egypt, r.r. town 60 mi. n. of Cairo; pop. 75,000; noted for fairs and moslem festivals held every 3 years; **1096.**
**Tan'talite** or **colum'bite,** a tantalum ore, **2247.**
**Tan'talum,** a silvery metallic element, **4042, 2247;** in electric light filaments, **1123–4.**
**Tan'talus,** in Gk. myth., **3433;** Niobe daughter of, **2510.**
**Taoism** (*tou'ĭzm*), a religion originating in China, **2993–4.**
**Taormina** (*tä-ôr-mē'nä*), Sicily, winter resort on e. coast, **3230;** anc. theater ruins, *picture,* **3229.**
**Taos** (*tä'ōs*) **Indians,** Pueblo tribe of s.w. U.S., **2933, 1767.**
**Tao Te King** ("Book of the Way and Virtue"). The sacred book of Taoism written by Lao-Tse.
**Tapa** (*tä'pä*) **cloth, 2366, 2622.**
**Tapajos** (*tä-pä-zhōsh'*), a river of Brazil, flows n. 1040 mi. to join Amazon; navigable about 200 mi. above its mouth; *map,* **494.**
**Tap'estry, 3433–4,** *picture,* **3435;** 'arras', **220;** Bayeux Tapestry, **2513, 1596;** carpets, **3079–80;** embroidery, **1140.**
**Tapeworm,** a parasitic flatworm, **3813–4, 2678;** evolutionary position, **128.**
**Tapioca** (*tăp-ĭ-ō'kȧ*), **3434.**
**Ta'pir,** animal related to rhinoceros and horse, **3434, 3436.**
**Tap'pan Sea,** N.Y., expansion of Hudson R., 12 mi. long, 3½ mi. wide; Tarrytown and Ossining on its shores; **1692.**
**Tap-root, 3063.**
**Tar,** dark oily liquid resulting from destructive distillation of wood or coal, **3436;** a wood preservative, **151;** coal-tar products, **814, 816;** tarred rope, **3065.**
**Tarantel'la,** an Italian dance, **3436.**
**Tar'antism, 3325.**
**Taranto** (*tä'rän-tō*). Seaport of s. Italy (anc. Tarentum) on Gulf of Taranto; pop. 56,000; large arsenal; oysters; textile mfrs.; **1835,** *map,* **1836.**
**Taran'tula,** any of several large hairy spiders, **3436–7, 3325.**
**Tarantula-killer,** a wasp, **3692.**
**Tarapaca** (*tä-rä-pä-kä'*), maritime province of n. Chile, **738, 2744.**

**Tarascon** (*tä-räs-kôn'*). Historic town of s.e. France on Rhone R.; pop. 9000; Rom. ruins and medieval church and castle.
**Tarbell, Ida M.** (born 1857), Amer. author, b. Erie County, Pa. ('History of the Standard Oil Company'); biography of Lincoln, **2016.**
**Tarbes** (*tärb*). Town of s.w. France; 75 mi. s.w. of Toulouse; pop. 29,000; horse-breeding; English under Wellington defeated French 1814.
**Tardieu** (*tär-dyû'*), **André** (born 1876). Fr. statesman; High Commissioner to U.S. 1917–19; plenipotentiary at Peace Conference 1919–20.
**Tarentum** (*tà-rĕn'tŭm*), chief anc. Gk. city in s. Italy; modern Taranto; **2941, 1966.**
**Tar-Heel State, 2517.**
**Tarhuna,** district of Tripoli, **3542.**
**Tarifa** (*tä-rē'fä*), Spain. Seaport on Strait of Gibraltar, southernmost town in Europe; pop. 13,000; anchovy and tunny fisheries; old Moorish walls.
**Tar'iff, 3437–8;** in England, **3437, 1155, 2706, 2869;** preferential, in Australia, **265;** Portugal, **2889.** —*In U.S. history:* first act passed, **3678;** "Tariff of Abominations" (1832), **575–6, 3348, 1857, 786;** of 1842, **1240;** of 1846, **2872;** Cleveland's and Harrison's administrations, **790, 1592, 2103;** Dingley Bill, **2104;** Payne-Aldrich, **3428;** Underwood-Simmons, **3437, 3746.** *See also in Index* **Free trade.**
**Tariff commission,** U.S., **3746, 3437–8.**
**Tarik** (d. 720?), Mohammedan chief, leader of first Moslem invasion of Spain, **1458.**
**Tarim** (*tä-rēm'*), chief r. of Chinese Turkestan; flows c. about 1000 mi. into group of lakes and marshes known as Lob Nor; **228,** *map,* **740.**
**Tar'kington, Booth** (born 1869). Amer. novelist, b. Indianapolis ('The Gentleman from Indiana'; 'Penrod'; 'Monsieur Beaucaire'; 'Alice Adams').
**Tar'kio College.** At Tarkio, Mo.; co-ed., Presb.; founded 1883; arts and science, normal school, music, commerce.
**Tarnopol** (*tär-nō'pōl*). Polish city 75 mi. s.e. of Lemberg; pop. 35,000; formerly in Austria; suffered from Russ. occupation in World War; flour mills, distilleries, breweries.
**Tarnow** (*tär'nŏv*), Poland. City 45 mi. e. of Cracow; pop. 30,000; farm implements, glass, chicory; captured by Russians 1914.
**Taro** (*tä'rō*), plant of Pacific isls., **1603, 2622.**
**Tarpe'ian Rock.** Cliff of Capitoline Hill, Rome, from which condemned criminals were thrown.
**Tarpon,** a large herring-like fish, **3438, 1279;** in Florida, **1297.**
**Tarpon Springs,** Fla., town and port on w. coast of Florida 22 mi. n.w. of Tampa; pop. 2105; sponge fisheries, **1298,** *picture,* **3329.**
**Tarquinii** (*tär-kwĭn'i-ī*), an anc. Etruscan city 45 mi. n.w. of Rome; site, near modern Corneto Tarquinia, marked by many remains, especially tombs; war with Rome, **3042.**
**Tarquin'ius Priscus,** 5th legendary king of Rome, **3041.**
**Tarquinius Superbus** ("The Proud"), 7th and last legendary king of Rome, **3041, 3229.**
**Tarquino,** highest mt. of Cuba, **936.**
**Tarragon,** a plant with aromatic leaves, **3104, 3319.**
**Tarragona** (*tär-rä-gō'nä*), Spain. Picturesque seaport town on Mediterranean at mouth of R. Francoli; pop. 25,000; exports wine, oil; anc. Tarraco, captured by Romans 218 B.C. in Second Punic War.
**Tar River,** N.C., rises in n. center, flows s.e. 220 mi., entering Pamlico Sound by Pamlico R., *map,* **2518.**
**Tarrytown,** N.Y., village on Hudson R., 25 mi. n. of New York City; pop. 5807; home of Washington Irving, **1831.**
**Tarshish, 3274.**
**Tarsus** (*tär'sŭs*). Splendid anc. city of s.c. Asia Minor, cap. of Cilicia; birthplace of St. Paul; modern Tersous (pop. 25,000).
**Tarsus,** the ankle, **1322;** elongated in birds, **400–1.**
**Tartar,** partly purified wine crust (argol), **3438.**
**Tartar, cream of, 3438, 1502.**
**Tartar emetic,** a salt of tartaric acid, **3438.**
**Tartaric acid, 3438;** contained in grapes, **10;** crystals, *picture,* **935.**
**Tartarin** (*tär-tà-răn'*). The boastful Quixotic hero of Daudet's humorous masterpieces, 'Tartarin of Tarascon', 'Tartarin on the Alps', and 'Port-Tarascon'.
**Tar'tars.** *See in Index* **Tatars.**
**Tar'tarus,** in Gk. myth., place of punishment, **1558, 3607.**
**Tartary,** old name for cent. Asia, **3440.**
**Tartu.** Same as **Dorpat.**
**'Tartuffe'** (*tär-tuf'*), play by Molière, **2279.**
**Taschereau** (*täsh-rō'*), **Elzéar Alexander** (1820–98). First Canadian cardinal, archbishop of Quebec.
**Tashkend'** or **Tashkent,** cap. of Rus. Turkestan and trade center; pop. 275,000; **3556.**
**Tasman** (*täs'măn*), **Abel Jansen** (1603?–59), greatest of Dutch navigators, **266, 2499, 2623.**
**Tasmania,** an isl. state of the Australian Commonwealth; 26,215 sq. mi.; pop. 200,000; cap. Hobart; **3438–9,** *map,* **264–5;** duckbill, **1046–7;** nickel, **2507.**
**Tasmanian devil,** a marsupial, **3439, 1908,** *picture,* **3438.**
**Tasmanian perch,** *picture,* **1271.**
**Tasmanian wolf,** a marsupial, **1908.**
**Tas'so, Torquato** (1544–95), Ital. poet, **3439–40, 1833.**
**Taste,** sense of, **3440, 3513;** confused with smell, **3252;** deficient in cats, **658.**
**Tatars** (*tä'tärz*), group of Cent. Asiatic tribes, **3440;** Crimea, **922;** Great Wall of China, **744–5,** *picture,* **741;** invade India, **1752;** Kumiss, **2239;** Manchus a branch, **2134;** Mongols absorb, **2285;** overrun Russia, **3089, 3096, 1853;** in Siberia, **3228, 3229;** related to Turks, **3557.**
**Tate** (*tāt*), **Nahum** (1652–1715), Eng. poet and playwright; b. Dublin; chiefly known for mangled versions of plays of Shakespeare, and for version of the Psalms in which he collaborated with Nicholas Brady; **2848.**
**Tate Gallery,** London, **2055.**
**'Tatler, The',** periodical published by Sir Richard Steele, **1165, 1178.**
**Tatra** (*tä'trä*) **Mts.** Central and loftiest group of Carpathians, on border between Poland and Czecho-Slovakia; highest point 8737 ft.
**Tattoo'ing, 3440;** in Africa, **37,** *picture,* **35;** Maori chief, *picture,* **2499;** in Samoa, **3121.**
**Tauchnitz** (*touĸ'nĭts*), **Christian B.** (1816–95). Ger. publisher; in 1841 he began publication of a collection of British and American authors, known everywhere as the "Tauchnitz edition," now numbering over 4000 volumes.
**Tauler** (*tou'lēr*), **Johann** (1300?–61), Ger. mystic, **2987.**
**Taun'ton,** England, town of Somersetshire, 38 mi. s.w. of Bristol; pop. 23,000; here Monmouth assumed title of king, and here Jeffrey held bloody assizes; defended by Blake in Civil War, **435.**
**Taunton,** Mass., mfg. and r.r. city 32 mi. s. of Boston on Taunton R.; pop. 37,137; varied mfrs., including cotton, foundry products, machinery, stoves, brick; tacks, **2388.**
**Taupo** (*tą'pō*), **Lake,** largest lake of North Isl., New Zealand, **2499.**
**Taurus** (*tą'rŭs*) or **Bull,** a constellation in the zodiac, **3840,** *charts,* **873, 3343;** includes Pleiades, **2838.**
**Taurus Mts.,** series of ranges in Asia Minor, extending w. from Euphrates; highest peaks over 10,000 ft.; n.e. extension sometimes called Anti-Taurus; **234, 1187.**
**Taxation, 3440–2;** of Amer. colonies, **3000–1, 3337–8;** Egypt (modern) **1096,** (anc.) **1102;** feudal system, **1236;** Gt. Brit., **2687–8, 1037, 1741, 2039–40, 3441;** income tax, **1741;** Italy, **1839;** Rom. provinces, **3046;** single tax, **3442;** stamp duties, **3337;** France, "old régime," **1366, 3116.** —*In U.S.,* **3440–2;** by county, **906;** income tax, **3428, 3746;** powers of Congress, **3593;** for schools, **1086;** by states, **3346;** tariff, **3437–8;** Treasury Dept., **3598;** during World War, **3748, 3802.** *See also in Index* **Stamp Act; Tariff.**
**Tax'idermy, 3442–3;** arsenic used, **220.**
**Taxon'omy,** science of plant or animal classification. *See in Index* **Classification.**
**Tay.** Largest river of Scotland; rises near borders of Perthshire and Argyllshire, flows e. 120 mi., expanding into estuary at Firth of Tay.
**Taylor, Ann** (1782–1866) and **Jane** (1783–1824). Eng. writers for children ('Rhymes for the Nursery', containing 'Twinkle, Twinkle, Little Star'; "marked an epoch in young people's literature").
**Taylor, Bert Leston** (1866–1921). Amer. newspaper man, b. Goshen, Mass.; the wit and wisdom of his daily column, 'A Line o' Type or Two', signed "B.L.T.," made him the premier "colyumist" of his day.
**Taylor, (James) Bayard** (1825–78). Amer. poet, journalist, and traveler, b. Kennett Square, Pa.; ambassador at Berlin, 1878 ('Poems of Home and Travel'; 'Views Afoot'; translation of 'Faust').
**Taylor, Sir Henry** (1800–86). Eng. poet, for 48 years a confidential official in the Colonial Office, for which he wrote innumerable state papers; his best work is 'Philip van Artevelde', a poetic tragedy performed with success by Macready.
**Taylor, Jeremy** (1613–67). Clergyman and author, called, for his golden eloquence and rich fancy, the "Eng. Chrysostom" ('Holy Living'; 'Holy Dying'—popular devotional manuals).
**Taylor, Rowland** (d. 1555), Eng. martyr, **2157.**
**Taylor, Tom** (1817–80). Popular Eng. dramatist and editor of *Punch* ('Our American Cousin'; numerous burlesques).
**Taylor, Zachary** (1784–1850), 12th president of U.S., **3444–5;** early life, **3444;** in Mexican War, **3444, 2207–8.** —*Administration:* gold rush, **581, 3103;** Compromise of 1850, **855–6;** Fillmore vice-president, **1240.**
**Tchad, Lake.** Same as **Chad.**
**Tchaikovsky.** Same as **Tschaikovsky.**
**Tchekhof.** Same as **Chekhof.**
**Tea, 3445–51, 230;** Ceylon, **685;** China, **744;** Japan, **1864, 1945;** preparation for market, *pictures,* **3447–9;** varieties, **3450–1,** *picture,* **3446.**
**Tea-berry** or **wintergreen, 3752.**
**Teachers' College,** at New York City; co-ed.; founded 1888; became part of Columbia Univ. 1900; training of teachers and school administrators; **2495.**
**'Teaching of the Twelve Apostles',** apocryphal book of the New Testament, **390.**
**Tea family,** the *Theaceae* or *Ternstroemiaceae,* **3942.**

**Teak** (*tēk*), an E. Indian tree with dark oily wood, **3451**; chief producing regions, **468, 541, 1748, 1877, 3226.**
**Teal** (*tēl*), small river duck, **1044,** *picture*. **1045.**
**Tea rose, 3066**; hybrid, *picture*, **3067.**
**Teas'dale, Sara** (Mrs. E. B. Filsinger) (born 1884). Amer. poet ('Rivers to the Sea'; 'Love Songs').
**Teasel** (*tē'zl*) or **teazel,** a plant with barbed burs, **3489–90.**
**Teaseling,** of textiles, **3787,** *picture*, **3786.**
**Teazle, Sir Peter.** In Sheridan's 'School for Scandal', testy but good-hearted old aristocrat, jealous of his lively, pretty young wife.
**Tecumseh** (*tē-kŭm'sē*) (1768–1813), Shawnee Indian chief, **3451–2**; Brit. aid charged, **3671**; opposes cession of Indian lands, **1594.**
**Tee,** in curling, **940**; in golf, **1484.**
**Teeth, 3452–4,** *pictures*, **3453, 2793**; of beaver, **356**; bears, **349**; birds lack, **400**; care of, **1714, 998**; cattle, **663**; dentistry, **997–8**; of gopher, **1488**; horse, **1683–4, 1685**; pyorrhea, **1452**; of rodents, **3036, 356**; sharks, **3196**; snakes, **3259**; whales, **3726, 1209.**
**Tegea** (*tē'ǧē-à*), Greece. Anc. city in Arcadia, near modern Tripolitza; engaged in many wars with Sparta, subdued about 550 B.C.
**Tegnér, Esaias** (1782–1846), Swedish poet ('Frithjofs Saga', best known of all Swedish poems), **3134.**
**Tegucigalpa** (*tā-ǧŭ-sē-ǧäl'pä*), cap. and chief city of Honduras; pop. 30,000; old Aztec city; **1676.**
**Teheran** (*tā-hĕ-rän'*), cap. of Persia in province of Teheran, 70 mi. s. of Caspian Sea; pop. over 220,000; large caravan trade, varied manufactures; **2734–5**; antiques, **3078**; porcelain gate, *picture*, **2736**; rev. of 1906, **2737.**
**Tehuantepec** (*tā-wän-tā-pĕk'*), Mexico, city in state of Oaxaco, 18 mi. from Pacific; pop. 18,000; oil field, **2212.**
**Tehuantepec, Isthmus of,** narrowest part of Mexico, between Gulf of Campeche and Gulf of Tehuantepec, **2515.**
**Telau'tograph, 3458.**
**Tel'egraph, 3454–8**; Edison repeater and stock quotation apparatus, **1083, 1084**; first U.S. line, **2164**; invented by Morse, **2330**; regulated as public utility, **2932**; "telegraphing" pictures, **3174**; U.S. govt. control in World War, **3802**; submarine cables, **556–61.**
**Telegraph, wireless, 3758–63.**
**Telegraph Plateau,** of Atlantic Ocean, **254, 561.**
**Tel-el-Amar'na letters, 1106.**
**Telemachus** (*tē-lĕm'ā-kŭs*), in the 'Odyssey', son of Odysseus and Penelope, **2562, 2564–6.**
**Telemachus,** Asiatic monk, **1466,** *picture*, **1467.**
**Tel'eosts,** sub-class of fish with well-developed skeletons, **3948**; evolutionary position, *diagram*, **128.**
**Telep'athy,** thought transference, **1718.**
**Tel'ephone, 3458–61**; Bell, **379–80**; dictograph, **1010**; regulated as public utility, **2932**; U.S. govt. control in World War, **3802.**
**Telephone, wireless, 3758–63.**
**Telepho'to camera,** one with telescopic lens for long-range work, **2783,** *picture*, **2780.**
**Tel'escope, 3462–3, 2551–2**; Galileo's, **1391,** *picture*, **241**; importance in astronomy, **239, 242**; lenses, **1986–8, 1474**; transit type, *picture*, **3500.**
**Telescope fish, 1483.**
**Telford, Thomas** (1757–1834), Scotch engineer, builder of several famous canals and pioneer in scientific road-making, **3024.**
**Tell, William,** legendary Swiss hero, **3463–5, 3415**; hero of Schiller's play, **3137.**
**Tell, The,** district in Algeria, **97.**
**Tellu'rium,** a rare element, **4042.**
**'Téméraire, The Fighting', 1246.**
**Temesvar** (*tĕm'ĕsh-vär*) or **Timisioara.** City of w. Rumania, 75 mi. n.e. of Belgrade; pop. 73,000; has suffered many sieges, especially by Hungarian insurgents in 1849; tobacco, textiles, paper, leather.
**Tem'pera painting, 2629.**
**Temperance, 3465, 3777, 2920–1.** *See also in Index* **Liquor laws.**
**Tem'perature, 1620**; altitude variation, **794, 312, 881**; climate, **794–5**; effect on bridges, **506**; most healthful, **1621–2**; highest and lowest attained, **1618, 1383, 1629 105, 7**; of human body, **3487, 3694**; liquid air, **2025**; measuring devices, **3486–7, 2941**; regulated by thermostat, **1624**; of sun, **3394.** *See also in Index* **Climate; Heat.**
**Temperature, sense of, 3520, 3521, 2314.**
**Tempering,** steel, **1824.**
**'Tempest The',** comedy by Shakespeare, **3465**; quotations from, **3192.**
**Tem'plars, Knights, 932, 2053.**
**Tem'plate,** in shipbuilding, **3216.**
**Temple,** Tex. Mfg. and trade city 35 mi. s.w. of Waco; pop. 11,033; agricultural implements, cotton products, flour, lumber.
**Temple, The,** London, **2053**; birthplace of Lamb, **1958.**
**Temple of Heaven,** Peking, **2707,** *picture*, **2708.**
**Temple of Solomon, 3274, 1885.**
**Temple of the Sun,** at Palmyra, Syria, *picture*, **2648.**
**Temples.** *See in Index* **Architecture.**
**Temple University.** Co-ed. non-sect. institution at Philadelphia, Pa.; founded 1884; liberal arts and sciences, law, medicine, theology, commercial education.
**Temuco** (*tā-mų'kō*), Chile. Town 140 mi. s.e. of port of Concepcion; pop. 34,000; tanneries, breweries.
**Ten Commandments, 2333.**
**Tenderloin,** a cut of beef, **2185.**
**Tendons, 2372, 1571**; Achilles tendon, **1322, 8.**
**Teneriffe** (*tĕn-ēr-ĭf'*), largest of Canary Isls.; 782 sq. mi.; pop. 180,000; **628.**
**Teneriffe,** volcanic peak, **628.**
**Teniers** (*tĕn'yērz*). **David** (1610–90), the Younger. Noted genre painter of Flemish school; son of David Teniers the Elder (1582–1649), also an important Flemish painter.
**Tennessee** (*tĕn-ĕ-sē'*), a s.-cent. state of U.S.; 42,022 sq. mi.; pop. 2,337,885; **3465–9,** *maps*, **3468, 3584–5**; Appalachians in, **3465, 158**; cap. Nashville, **2398**; Chattanooga, **701**; Memphis, **2198**; origin of name, **3347**; physical features, **3465–6**; products and resources, **3468**; state flower, **3347.** —*History*, **3468–9, 2198**; De Soto's expedition, **999**; Boone explores, **464**; state of Franklin organized, **3469, 3181**; John Sevier, **3181**; Civil War, **3469, 700–1, 1897, 3206–7.**
**Tennessee, University of,** at Knoxville, Tenn.; non-sectarian, co-ed.; founded as Blount College (1794); liberal arts, engineering, agriculture, law, medicine, dentistry, graduate school; large summer school; science building, *picture*, **3467.**
**Tennessee River,** largest tributary of Ohio R., **3466,** *map*, **3468**; Muscle Shoals, **72.**
**Tenniel** (*tĕn'yĕl*), **Sir John** (1820–1914), Eng. political cartoonist, on staff of *Punch* for 50 years; noted for grace and dignity of conception combined with powerful satire; illustrates 'Alice in Wonderland', **647.**
**Tennis, 3469–70,** *picture*, **3471.**
**Tennis ball, 3469**; how made, **3076.**
**Tennis Court Oath,** in Fr. Rev., **1179, 1367.**
**Ten'nyson, Alfred** (1809–92), Eng. poet, **3470, 3472, 1167**; use of Arthurian legends, **223**; quoted, **754, 1028, 2938.**
**Tenochtitlan** (*tā-nōch-tēt-län'*), Aztec city, **288–9, 290.**
**Ten-pins,** form of bowling, **475.**
**Tense,** in grammar, **3627.**
**Tenskwa'tawa** or **The Prophet** (1775?–1834), Shawnee leader, brother of Tecumseh; preached return of his people to primitive ways; resists invasion of white settlers, **3452, 1594.**
**Ten'tacles,** long flexible grasping organs; of cuttlefish, **941, 942, 2280**; "feelers" of coral, **886**; of hydra, **1708,** *picture*, **1707**; jellyfish, **1883,** *picture*, **1884**; nautilus, **2418, 2280**; octopus, **943, 2280**; sea anemones, **3164**; snails, **3256, 2280**; squids, **942, 2280,** *pictures*, **941, 943.**
**Tent caterpillar.** Caterpillars of moths of the genus *Clisiocampa*, particularly the apple-tree moths of the n.e. U.S.; the eggs are laid in bands glued about twigs of fruit trees and when they hatch, the caterpillars spin across to forking twigs triangular silken tents, in which they grow, going out in the daytime to feed on foliage; they become full grown in June and spin cocoons, from which the moths emerge in July.
**Ten Thousand, Retreat of the, 3823, 1656.**
**Tents, 595–6**; Arab, **167**; Indian tepees, **1770.**
**Ten'ure of Office Bill,** passed by Congress 1867; made removals from office by the president dependent upon "the advice and consent of the Senate"; **1898.**
**Teodoro River.** *See in Index* **Rio Teodoro.**
**Tepary bean, 347.**
**Te'pee,** tent of Amer. Indians, **1770.**
**Tepetate-Casiano,** oil pool, **2752.**
**Tepic** (*tā-pēk'*), Mexico. *See in Index* **Nayarit.**
**Ter'bium,** a rare chemical element, **4042.**
**Ter'ebinth,** a tree of the genus Pistacia, which also includes pistachio nut; resembles the ash, but smaller; original source of turpentine; **2645.**
**Tere'do** or **shipworm,** a crustacean which bores into wood, **3201**; attacks cables, *pictures*, **556.**
**Terek** (*tā'rĕk*), r. in s. Russia, rises in glaciers on n. slope of Caucasus Mts.; flows e. 400 mi.; outlet, **654.**
**Ter'ence** (Publius Terentius Afer) (190?–159 B.C.), Rom. dramatist, b. Carthage, Africa, **1966**; inspired by Menander, **1033**; chief works, **1038.**
**Teresa** (*tā-rā'sä*), **Saint** (1515–82). Span. nun; famous mystic, 2d patron saint of Span. monarchy and founder of the Barefooted Carmelites.
**Tereus** (*tē'rŭs*). *See in Index* **Philomel.**
**Terias nicippe,** a butterfly, color plate facing **548.**
**Ter'mites,** the so-called "white ants," **143, 1788**; Australian plague, **269.**
**Termonde** (*tĕr-mônd'*), Belgium. Fortified town on Scheldt R., 20 mi. s.w. of Antwerp; pop. 10,000; taken by Germans in drive on Antwerp and destroyed Sept. 1914; rehabilitated after World War.
**Terni** (*tĕr'nē*) (anc. Interamna), Italy. Mfg. city 50 mi. n. of Rome; pop. 33,000; near famous falls of Terni; govt. arsenal, iron, steel, textile mfrs.; Neapolitans defeated by French 1798.
**Terns,** gull-like birds, **1549–51,** *picture*, **413**; migrations, **2231.**
**Terpsichore** (*tērp-sĭk'ō-rē*), in Gk. myth., muse of dancing, **2373,** *picture*, **156.**
**Terracina** (*tĕr-rä-chē'nä*) (Lat. Tarracina), Italy. Historic town, 56 mi. s.e. of Rome; pop. 12,000; remains of anc. Forum and temple.

**Terra cotta,** 531.
**'Terra Nova',** Capt. Scott's ship, 3150.
**Ter'rapin** or **mud-turtle,** 3563; called marsh tortoise, 3520; in Maryland, 2160.
**Terre Haute** (*tĕr'rĕ hōt*), Ind., mfg. and shipping point on Wabash R. 70 mi. s.w. of Indianapolis; pop. 66,083; rich coal mining and farming, clay, and oil region; Indiana State Normal School, Rose Polytechnic Institute, St. Mary of the Woods School; manufactures, 1760; Harrison fortifies, 3452.
**Ter'rier,** a burrowing type of dog, 1022–3, *pictures,* 1021.
**Ter'ritories** (U.S.), government of, 2529, 3601; Alaska, 74–9; Hawaii, 1601–5.
**Ter River,** Spain. Rises in the Pyrenees in the n.e. corner, flows s. and e. 110 mi., entering the Mediterranean by several mouths s. of the Gulf of Rosas.
**Terror, The.** *See in Index* **Reign of Terror.**
**Terrorists,** Russian, 3269.
**Terry, Alfred Howe** (1827–90), Amer. general, b. Hartford, Conn.; served throughout Civil War, and in 1876 commanded main column which drove Sitting Bull into Canada after Custer massacre; 2884.
**Terry, Ellen** (born 1848). Eng. Shakespearean actress, long associated with Sir Henry Irving; she had few rivals in the grace and intellectual grasp with which she portrayed characters such as Portia, Lady Macbeth, Desdemona, and Cordelia.
**Tertiary** (*tĕr'shĭ-ā-rĭ*) **time,** in geology, 1418, 1422; period of petroleum formation, 2752.
**Tertul'lian** (155?–222? A.D.). One of great fathers of the Latin church, b. Carthage, called creator of Christian Latin literature.
**Tesch'en,** Czecho-Slovakia; pop. 25,000; chief city in region which supplied only available coking coal to Poland and Czecho-Slovakia; most of area awarded to Czecho-Slovakia by council of Allied Ambassadors, but Poland receives part of coal output; plebiscite area, 948, *map,* 947.
**Teschen, Peace of,** 2147.
**Tes'la, Nikola** (born 1857), Amer. inventor and electrician, b. Croatia; discovered principle of rotary magnetic field, which made possible the alternating current motor; 1122; Nobel prize, 2513.
**Tes'selated mosaics,** 2330.
**Testry** (*tĕs-trē'*), France, small town near Somme R., n. of Soissons; battle of (687), 1658.
**Tests and measurements.** *See in Index* **Measurements and tests.**
**Tet'anus** or **lockjaw,** 151, 152, 1450; bacillus, *picture,* 1451.
**Tethmosis** or **Thutmose III** (1501 B.C.–1447 B.C.), Egyptian pharaoh, 1655, 1105.
**Te'ton Mts.,** a range of the Rocky Mts. in n.w. Wyoming, 3036, *map,* 3820.
**Tetrazzini** (*tĕt-răt-sē'nē*), **Luisa** (born 1874). Italian coloratura soprano ('La Traviata'; 'Rigoletto'; 'Lucia di Lammermoor').
**Tetzel** (*tĕt'sĕl*), **Johann** (1455?–1519), Dominican monk, 2987, 2085.
**'Teucer'** (*tū'sẽr*), statue by Thornycroft, *picture,* 3161.
**Teufelsdröckh** (*toi'fĕlz-drûk*), **Diogenes.** In Carlyle's 'Sartor Resartus', its fictitious author, professor of Things in General at Weissnichtwo.
**Teutoburger** (*toi'tō-bŭr-gẽr*) **Forest,** Germany, series of wooded hills on Westphalia-Hanover border extending 70 mi. from n.w. to s.e.; battle of (9 A.D.), 1446.
**Teutones** (*tū'tō-nēz*), Ger. tribe, defeated by Marius, 3046.
**Teuton'ic Knights,** christianize Baltic regions, 1180, 1969, 2030, 962; conquer Prussia, 2928; war with Poland, 2859.
**Teutonic languages.** *See in Index* **Germanic languages.**
**Teu'tons,** group of European peoples, 3472, 2956; in Scandinavia, 3134. *See also in Index* **German tribes.**
**Tewkesbury** (*tūks'bĕr-ĭ*), England. Historic town in n. Gloucestershire on the Avon; remains of famous Benedictine abbey; Yorkists defeated Lancastrians 1471 in Wars of the Roses.
**Texarkan'a,** Tex. and Ark. Two cities about 30 mi. from s.e. corner of Oklahoma, forming one community commercially and industrially; pop. (Tex.) 11,480; (Ark.) 8257; large trade; cotton products, furniture, pottery, lumber, hides.
**Tex'as,** a state in s.w. U.S., largest in the Union; 265,896 sq. mi.; pop. 4,663,228; cap. Austin; 3473–9, *maps,* 3474, 3478, 3584–5; agriculture, 3473, 3474, 2196, 2705, 2706; black waxy belt, 3474, 953; cities and manufactures, 3477–8, 953–4, 1139, 1333, 1392, 1688, 3121; climate 3473; number of counties, 906; education, 3478; export trade, 1392, 1688; extent and physical features, 3473, 3474, 3475; irrigation, 3476, 1829; minerals, 3476, 1629; origin of name, 3347; ostrich farming, 2603; petroleum, 3473, 2754, 1333; population, 3476–7; Pueblo Indians, 2933; rivers, 3476, 3022; state flower, 3347; state police, 2866. —*History,* 3478–9; LaSalle's colony, 1964; Austin and war for independence, 261, 922, 3121; Sam Houston, 1683; annexation to U.S., 2872, 3571; loses part of "panhandle," 2576; boundary dispute and Mexican War, 2207–8.
**Texas, University of,** at Austin, Tex.; co-ed., state control; opened 1883 (organized 1881); arts and science, law, engineering, education; 3478, *picture,* 3477.
**Texas Rangers,** state police, 2866, 3479, *picture,* 2865.
**Texcoco** (*tās-kō'kō*), **Lake,** Mexico; water only 2 ft. deep; controlled by great drainage canal; 2218.
**Tex'tile industries,** in Belgium, 374; of China, 744, 3498; England, 1158, 1160, 2134; France, 1348; Japan, 1866; linen centers, 2018. —*In U.S.* 3585; Ala., 72; Mass., 2165–6, 1223, 1973, 2075; N.H., 2454; N.J., 2458, 2694; N.Y., 2485; N.C., 2519; Pa., 2720, 2762, 3153; R.I., 3007, 3010, 2927. *See in Index* **Cloth; Cotton manufactures; Spinning and weaving.**
**Thackeray** (*thăk'ẽr-ā*), **William Makepeace** (1811–63), Eng. novelist, 3479, 2540, 2542; birthplace, 573; as essayist, 1178; story, 'Colonel Newcome, the Finest Gentleman in Fiction', 3480–1.
**Thakombau,** king of Fiji Isls., 1239.
**Thales** (*thā'lēz*) **of Miletus** (640?–546? B.C.), Gk. philosopher, one of the "seven wise men," 3275; founded abstract geometry, 1422; noted electric properties of amber, 1117; regarded water as the primal substance.
**Thalia** (*thā-lī'ā*), in Gk. myth., one of the three Graces, 155.
**Thalia,** muse of comedy, 2373, *picture,* 156.
**Thal'lium,** a metallic element, 4042.
**Thal'lophytes,** great plant group containing the most primitive types, 2831, 3937.
**Thames** (*tēmz*), r. in Ontario, Canada, 160 mi. long flowing into L. St. Clair, 2057.
**Thames,** estuary in c. Connecticut, 15 mi. long; *map,* 864; valley, 866.
**Thames,** largest r. of England, 3482, 1160; at London, 2051, 2053; subway, 3552; at Windsor, *picture,* 1154.
**Thames, battle of the** (1813), 3672, 1594; Tecumseh killed, 3452.
**Thames Embankment,** London, 2053.
**'Thanatop'sis',** poem by Bryant, 521.
**Than'et, Octave.** Pen name of Alice French (born 1850), Amer. novelist, b. Andover, Mass. ('Expiation'; 'The Heart of Toil').
**Thanksgiving,** Amer. holiday, 3482.
**Thar** (*thär*) **Desert,** n. India, embracing part of Sind and Rajputana; climate, 1747.
**Thasos** (*thā'sŏs*), Gk. isl. in n. Aegean, off coast of Thrace; pop. 12,000; 1520, *map,* 27.
**Thax'ter, Celia** (1836–94). Amer. poet, b. Portsmouth, N.H. ('Drift Weed'; 'Stories and Poems for Children').
**Thayendanegea.** *See in Index* **Brant, Joseph.**
**Thayer** (*thā'ẽr*), **Abbott Handerson** (1849–1921), Amer. artist and naturalist; on protective coloration, 2924.
**The'ater,** 3482–5; Elizabethan, *pictures,* 1034, 3191; fireproofing, 1263; Greek "orchestra," 2591; heating and ventilating, *picture,* 1623; Japanese, *picture,* 1865; of Middle Ages, *picture,* 1033. *See also in Index* **Drama.**
**Theba'is,** Egypt, desert region near Thebes, 2298.
**Thebes** (*thēbz*), Egypt, anc. cap. of Upper Egypt, on Nile, on site of modern villages of Karnak and Luxor; famous temples; 1104–5, 569–70, 1094.
**Thebes,** Greece, 3485–6, 1525; razed by Alexander the Great, 86; Cadmus legend, 563; modern town, 1527; Oedipus story, 2566; in Trojan War, 1520.
**Theine** (*thē'ĭn*), an alkaloid in tea, 3446, 823.
**Theiss** (*tīs*) or **Tisza** (*tē'zȧ*), r. of s.e. Europe; rises in Carpathian Mts.; flows s. with many windings 870 mi.; 1702, *map,* 308.
**Themis** (*thē'mis*). In Gk. myth., one of the Titans, goddess of eternal law and order; by Zeus she became mother of the Hours and the Fates; in art she is usually pictured with cornucopia and scales.
**Themistocles** (*thē-mĭs'tō-klēz*) (514?–449 B.C.), a great Athenian general and statesman; and Aristides, 194–5; lays foundations of Athenian Empire, 1522; long walls, 249; battle of Salamis, 3113, 2740.
**Theobro'mine,** alkaloid in cocoa and chocolate, 756.
**Theocritus** (*thē-ŏk'rĭ-tŭs*) (3d cent. B.C.), first and greatest of Gk. pastoral poets, 1538, 88.
**Theod'olite,** an instrument for measuring angles, used in surveying, 3398.
**Theodo'ra** (d. 547? A.D.), consort and colleague of the Byzantine emperor Justinian I; originally dancer and actress; harsh and cruel but able ruler; 1905; portrayed in mosaic, *picture,* 2630.
**The'odore III** (1818–68), emperor of Abyssinia; succeeded his uncle as chief of Kwara and after many conquests was proclaimed emperor 1855; 3.
**Theodoric** (*thē-ŏd'ō-rĭk*) **the Great** (454?–526), king of the Ostrogoths, greatest Gothic ruler; in Ger. legend became the hero Dietrich of Bern; 1491, 2979, 2896.
**Theodosia,** Russia. Same as **Feodosia.**
**Theodo'sius the Great** (346?–395), Rom. emperor, succeeded 379; conquered frontier barbarians; prohibited heathen worship; recognized orthodox Catholicism; accepted penance prescribed by St. Ambrose for Thessalonica massacre; abolishes Olympic Games, 2581; closes pagan temples, 3178.
**Theophrastus** (*thē-ō-frăs'tŭs*) (372?–287 B.C.), Gk. philosopher, successor

of Aristotle as head of Peripatetic School, **1538.**
**The'orem,** in geometry, **1425.**
**Therapeutics** (*thĕr-ȧ-pū'tĭks*) or **ther'apy.** Part of medical science which relates to treatment and remedies for disease. *See in Index* **Medicine and surgery.**
**Therapy, mental, 2193.**
**Theresa, Saint.** *See in Index* **Teresa.**
**Theresiopel** (*tā-rā-zē-ō'pĕl*), also **Subotica.** City in Jugo-Slavia, 100 mi. n.w. of Belgrade; pop. 95,000; agricultural center; linens, shoes.
**Thermae** (*thĕr'mē*), Rom. baths, **3052, 3058, 2876,** *picture,* **3057.**
**Ther'mal unit, British, 1618, 1620,** *picture,* **1619.**
**Thermic sense, 2314–5.**
**Ther'mit,** a metallic mixture, **105.**
**Ther'mocouple,** device for converting heat energy into electric current, **1113.**
**Thermocouple pyrom'eters, 2941.**
**Ther'mograph,** a temperature-recording device, **3487.**
**Thermom'eter, 3486–7, 1620;** invented by Galileo, **1392;** for measuring high temperatures, **2941;** microthermometer, **1722;** why mercury is used, **2199, 3486.**
**Thermopylae** (*thĕr-mŏp'ĭ-lē*), pass leading from Thessaly into central Greece, where Spartans heroically attempted to check Persian invasion (480 B.C.), **3487;** battle, **2740.**
**Ther'mos bottle, 3614.**
**Ther'mostat,** device for regulating temperature, **1624.**
**Thermot'ics,** division of physics, **2786.**
**Thersites** (*thĕr-sī'tēz*). In Homer, the one ugly, hateful, slanderous brawler among the Greeks before Troy.
**Theseum** (*thē-sē'ŭm*) or **Temple of Theseus,** Athens, **251, 3487,** *picture,* **250.**
**Theseus** (*thē'sūs*), Gk. legendary hero, slayer of Minotaur, **3487, 678;** sculpture by Barye, *picture,* **3160;** character in Chaucer's 'Canterbury Tales', **704, 706.**
**Thespiae** (*thĕs'pĭ-ē*). Anc. Gk. city of Boeotia near foot of Mt. Helicon; enemy of Thebes; served national cause against Persians.
**Thes'pis** (6th cent. B.C.), Gk. poet, called the inventor of tragedy; hence "thespian," an actor; **1032.**
**Thessalo'nians, Epistles to the,** in New Testament, two of St. Paul's epistles dealing with second coming of Christ, **3114.**
**Thessaloni'ca,** anc. name of Saloniki, **3114–5.**
**Thes'saly,** dist. in Greece, s. of Macedonia; largest division of anc. Greece; *map,* **1518;** added to modern Greece, **1526;** Vlachs, **1528.**
**Thet'ford,** England. Old town 75 mi. n.e. of London; Castle Hill, anc. mound 1000 ft. in circumference and 100 ft. high.
**Thetford Mines,** Quebec, town 55 mi. s. of Quebec; pop. 7500; extensive asbestos mines; *picture,* 225.
**Thetis** (*thē'tĭs*), in Gk. myth., sea nymph, one of Nereids and mother of Achilles, **8, 9, 1627;** marriage feast, **3542.**
**"They shall not pass," 3629, 3794.**
**Thiassi** (*tyä'sē*), a giant in Scandinavian myth., **3135–6.**
**Thibault** (*tē-bō'*), **J. A.** *See in Index* **France, Anatole.**
**Thibet.** Same as **Tibet.**
**Thiers** (*tyĕr*), **Louis Adolphe** (1797–1877), Fr. statesman and historian, first president of Fr. republic, **1356.**
**Thigmot'ropism, 2828.**
**Thinis** or **This,** Egypt, **1099.**
**'Thinker, The',** statue by Rodin, *picture,* **3037.**
**Thiosul'phate of sodium** ("hypo"), **3271, 3390.**
**Third Coalition, 2394.**
**Third Estate, 1366, 1367, 2259.**
**Third International,** extreme Socialist organization, **3096.**
**Third rail system,** of electric traction, **3372.**
**Third Republic,** France, **1353.**
**Thirteen Colonies.** *See in Index* **United States history.**
**Thirty Thousand Islands,** Georgian Bay, **1705.**
**Thirty Years' War** (1618–48), **3488–9, 1553–4;** political results, **1195, 3489, 1448, 447;** Richelicu, **3018;** rise of modern armies, **218.**
**Thisbe** (*thĭz'bē*), maiden loved by Pyramus in the classic tale of 'Pyramus and Thisbe,' **2230.**
**Thistle, 3489–90;** seeds, **3172, 3173.**
**Thistle, Order of the, 979.**
**Thivai** (*thē'vĕ*) or **Phiva,** modern name for Thebes, Greece, **3486.**
**Thlingits.** Same as **Tlinkits.**
**Thomas, Augustus** (born 1859), Amer. playwright; chief plays, **1038.**
**Thomas, George Henry** (1816–70), Amer. general, **3490, 700–1.**
**Thomas, Isaiah** (1749–1831), Amer. printer and publisher, **3787.**
**Thomas, Saint,** one of Twelve Apostles, **157.**
**Thomas, Theodore** (1835–1905). Amer. musician and conductor, b. Germany; organizer of the Chicago Symphony Orchestra and popularizer of Wagner.
**Thomas à Kempis.** *See in Index* **Kempis.**
**Thomas Becket.** *See in Index* **Becket.**
**Thompson, Benjamin.** *See in Index* **Rumford.**
**Thompson, David** (1770–1857). Canadian explorer and surveyor, first white man to follow Columbia R. from source to mouth; worked on U.S.–Canadian boundary survey, 1816–26.
**Thompson, Francis** (1860–1907). Eng. poet and mystic; "for glory of inspiration and natural magnificence of utterance he is unique among the poets of his time" ('The Hound of Heaven', strange over-sumptuous religious lyric).
**Thompson, (James) Maurice** (1844–1901), Amer. novelist, poet, and nature-lover, b. Fairfield, Ind. ('Alice of Old Vincennes'; 'The Boy's Book of Sport'); quoted, **431.**
**Thompson, Sir John David Sparrow** (1844–94). Canadian jurist and statesman; sometime premier of Nova Scotia and judge of the provincial supreme court; Dominion Minister of Justice 1885–92, premier 1892–94.
**Thomson, Elihu** (born 1853), Amer. inventor and electrician, b. Manchester, England; electric welding process, **3716.**
**Thomson, James** (1700–48), Scotch poet, pioneer of romantic movement in Eng. literature ('The Seasons'), **1166.**
**Thomson, James, "B. V."** (1834–82). Brit. poet and journalist; profoundly melancholy and pessimistic 'The City of Dreadful Night', unique "litany of pessimism").
**Thomson, J. Arthur** (born 1861), Brit. zoölogist, author of many interesting works, including 'The Wonder of Life'; editor of 'The Outline of Science'; quoted, **1647.**
**Thomson, Sir Joseph John** (born 1856), Eng. physicist, *picture,* **1122;** developed electron theory, **1112, 256, 3824, 1122.**
**Thomson, William.** *See in Index* **Kelvin, William Thomson, Baron.**
**Thor,** in Norse myth., god of thunder, **3490–2, 3135;** worshiped by early Germans, **1446, 1435.**
**Tho'rax,** part of the body between head or neck and the abdomen; abdomen separated by diaphragm in mammals, **1005;** of crabs, **912;** of insects, **1787,** *picture,* **1788;** of lobster, **2041;** of spiders, **3326.**
**Thoreau** (*thō-rō'*), **Henry David** (1817–62), Amer. naturalist and writer, **3492, 113;** at Concord, **856;** nature study, **2412.**
**Thor'finn Karlsef'ni,** Scandinavian explorer, who led expedition to N. Amer. 1002–07, **2526–7.**
**Tho'rium,** a rare metallic element, **4042;** used in Welsbach mantles, **1407;** radioactive properties, **2960;** source, **2247.**
**Thorn** (*tôrn*) or **Torun,** Poland. Fortified town on Vistula R., formerly in w. Prussia, Germany; pop. 46,000; birthplace of Copernicus; threatcned by Russians in World War.
**Thorn apple,** the jimson weed (*Datura stramonium*), **2854,** *picture,* **2853;** seeds poisonous, **3173.**
**Thorn apple** or **scarlet haw,** a shrub-by tree, **1379.**
**Thorns,** why plants grow them, **2827,** *picture,* **2826.**
**Thornycroft, Sir William Hamo** (born 1850), Brit. sculptor; 'Teucer', *picture,* **3161.**
**Thorny oyster shell,** *picture,* **3203.**
**Thor'old,** Ontario, town 26 mi. n.w. of Buffalo, N.Y., on Welland Canal; pop. 2500; **3716.**
**Thorvaldsen** (*tôr'wȧld-sĕn*), **Bertel** (1770–1844), Danish sculptor, greatest 19th cent. classicist ('Night'; 'Morning'; 'Lion of Lucerne'), **3158;** Copenhagen museum, **880.**
**Thoth** (*tōt*). Egyptian god of wisdom and letters; identified by the Greeks with Hermes.
**'Thoughts',** frontispiece, Vol. 7.
**'Thousand and One Nights'.** *See in Index* **'Arabian Nights'.**
**Thousand Islands,** in St. Lawrence R., **2482, 3108.**
**Thousand Springs,** Idaho, **1725.**
**Thrace,** region in e. of Balkan Peninsula varying in extent at different periods; held by Turkey from 1453 to 1878 when n. part, by Treaty of Berlin, was placed under separate administration as Eastern Rumelia, later a part of Bulgaria; scene of heavy fighting in World War; *maps,* **308, 1518;** chief city Adrianople, **26;** ceded to Greece, **1526, 3626.**
**Thrale, Mrs. Hester** (1741–1821), Eng. woman, wife of Henry Thrale, a brewer; after his death married an Ital. musician named Piozzi; wrote delightful letters and was central figure of a charming literary and artistic circle; friend of Dr. Johnson, **1899.**
**Thrasher,** an Amer. thrush, **3492–3.**
**Thread, 3493;** mercerized, **2198–9;** silk, **3237–8;** spinning, **904.**
**Threadneedle Street,** London, **2051.**
**Thread-waisted wasp,** color plate facing **359.**
**Threadworms, 3814.**
**"Three Deep,"** game, **2835.**
**Three-field system of agriculture, 48,** *picture,* **44.**
**Three-horned beetle,** *picture,* **367.**
**Three Kings of Cologne, 834.**
**Three-mile limit,** in international law, **1794.**
**'Three Musketeers, The',** novel by Dumas, **1047–8.**
**"Three Petticoats, League of the," 3180.**
**Three Rivers,** Quebec. Port on St. Lawrence and St. Maurice rivers; pop. 22,500; exports lumber, grain, cattle; wood, paper, and pulp industries; founded 1634; surrendered to Americans 1775, taken by the British following year.
**Three-toed woodpecker,** foot, *picture,* **409.**
**Thresher shark, 3197.**
**Threshing, 3493–4, 3731,** *picture,* **605;** primitive methods, *pictures,* **46.**
**Thrips** or **"leaf-hoppers,"** small insects closely related to the aphids, **3946;** killed by sprays, **3330.**
**Throat:** larynx and vocal chords, **3656–7;** windpipe, **2083.**
**Throat, sore,** how to treat, **1270.**

**Throwing,** in pottery-making, **2904;** silk, **3238.**
**"Thrums," 333.**
**Thrush, mimic, 3493, 2275.**
**Thrush family,** of birds, **3494;** bluebird, **439;** robin, **3028;** seasonal migrations, **2231.**
**Thucydides** (*thū-sĭd'ĭ-dēz*) (about 471–396 B.C.), Gk. historian, greatest of antiquity, **1537;** Pericles' funeral oration, **2730.**
**Thugs.** An organization of professional murderers in India who strangled their victims in honor of the goddess Kali, wife of Siva; killed 30,000 natives a year; suppressed by Brit. govt. 1840.
**Thule** (*thū'lē*), old name for Shetland Isls., **3206.**
**Thu'lium,** a rare metallic element, **4042.**
**Thumb, 1571, 2289, 1795,** *picture,* **153.**
**Thun** (*tųn*), **Lake of.** Lake in canton of Bern, Switzerland, w. of Interlaken, an expansion of Aar R., 10 mi. long by 2 mi. wide.
**Thunder, 2006, 3614.**
**Thundercloud, 809.**
**Thunder showers, 3366, 2972–3.**
**Thuringia** (*thū-rĭn'ĝĭ-ȧ*), republic in cent. Germany formed 1919 by union of former states of Saxe-Weimar - Eisenach, Saxe - Meiningen, Gotha, Saxe-Altenburg, Reuss, Schwarzburg-Rudolstadt, Schwarzburg-Sonderhausen; 4546 sq. mi.; pop. 1,510,000; cap. Weimar, **3715–6.**
**Thuringian Forest** (Thüringer Wald), range of hills in Germany from Werra R. near Eisenach s.e. to Bavarian frontier; magnificent pine forests; **1439,** *map,* **1440.**
**Thursday,** 5th day of week; origin of name, **969.**
**Thutmose III.** Same as **Tethmosis.**
**Thwing, Charles Franklin** (born 1853). Amer. educator and author, b. New Sharon, Me.; pres. Western Reserve Univ. since 1890.
**Thyestes** (*thī-ĕs'tēz*). *See in Index* **Aegisthus; Atreus.**
**Thylacine** (*thī'lȧ-sīn*) or **Tasmanian wolf, 1908.**
**Thyme** (*tīm*), plant used for seasoning, **3318, 3319.**
**Thy'roid cartilage, 3656–7,** *picture,* **2083.**
**Thyroid gland, 1469, 1470.**
**Thyrox'in,** secretion of the thyroid gland, **1470.**
**Thysanu'ra,** an order of wingless insects, **1788.**
**Tiahuanaco** (*tē-ä-wä-nä'kō*), village in Bolivia 38 mi. n.w. of La Paz; ruins, **449.**
**Tian Shan.** Same as **Tien Shan.**
**Tib'bu** or **Te'bu,** a nomadic people of the Sahara, **3105.**
**Ti'ber,** famous r. of cent. Italy, **3494, 3040, 3056,** *picture,* **3054;** story, 'How Horatius Kept the Bridge', **3494–5.**
**Tiberias** (*tī-bē'rĭ-ȧs*), town in Palestine on w. shore of Sea of Galilee, n.e. of Nazareth; modern Tabarîya; school of rabbis, **390.**
**Tiberias, Sea of.** *See in Index* **Galilee.**
**Tiberius** (*tī-bē'rĭ-ŭs*), **Claudius Nero** (42 B.C.–37 A.D.), 2d Rom. emperor, **3047;** palaces on Capri, **2390.**
**Tibet'** or **Thibet,** country in cent. Asia, nominally a Chinese dependency; 463,000 sq. mi.; pop. 2,000,000; cap. Lhasa; **3495–6, 226, 740,** *maps,* **740, 1744, 232–3;** borax, **464;** brick tea, **3451;** butter, **544;** climate, **794, 1650, 2973;** Himalaya Mts., **1649–50;** religion, **525, 3496;** yaks, **3827,** *pictures,* **231, 3496;** Yangtze R., **3827.**
**Tibullus** (*tĭ-bŭl'ŭs*), **Albius** (54?–19 B.C.), Rom. poet, **1967.**
**Ticino** (*tē-chē'nō*), canton in s. Switzerland; 1088 sq. mi.; pop. 152,000; language, **3415.**
**Ticino River,** in Switzerland and Italy, 150 mi. long; flows into Po, **3414.**
**Tick,** a minute parasite of the arachnid type, **3322, 2678;** miscalled an insect, **1787;** name also applied to various parasitic insects, such as the following.
**Tick, sheep,** a blood-sucking fly, **1313,** *picture,* **2679.**
**Ticker,** stock quotation telegraph receiver, invented by Edison, **1083.**
**Ticonderoga** (*tī-kŏn-dĕr-ō'gȧ*), N.Y., village on outlet from L. George to L. Champlain, 85 mi. n.e. of Albany; pop. 2102; fort taken by British (1759), **1362;** by Ethan Allen, **98, 219;** by Burgoyne, **3003.**
**Tidal waves,** in Bay of Fundy, *picture,* **3498;** in Pacific, **2623;** in rivers, **3497, 1574.**
**Tide, 3496–8, 2323;** double tide at Southampton, **3290;** in Gulf of Mexico, **1548;** harbors of Europe, **1188;** Mediterranean, **1188;** in mythology, **221,** *picture,* **221;** predicted by machine, **571.**
**Tide predictor,** a machine, **571.**
**Tidewater region,** Maryland, **2160;** Virginia, **3647.**
**Tidore** (*tē-dōr'*), small isl. of Malay Archipelago; Magellan's crew at, *picture,* **1061.**
**Tien Shan** (*tē-ĕn' shän'*), mt. range in cent. Asia, **226, 739, 3555,** *map,* **740.**
**Tientsin** (*tē-ĕn'tsēn'*), seaport in n. China; pop. 1,000,000; **3498.**
**Tierce** (*tērs*), a prayer, **2299, 2300.**
**Tierra del Fuego** (*tē-ĕr'ä dĕl fų-ā'gō*) ("land of fire"), archipelago at s. extremity of S. Amer., **3285, 735–6,** *map,* **3288–9;** Andes, **123.**
**Tierras frias** ("cold lands"), **2210.**
**Ties, railroad,** creosote treatment, **918;** cypress used for, **946;** laid by machine, *picture,* **2967.**
**Tif'fin,** Ohio. Industrial center of farming, clay, and glass-sand region, on Sandusky R., 80 mi. n. of Columbus; pop. 14,375; Heidelberg Univ.
**Tiflis** (*tē-flēs'*), cap. of republic of Georgia, at s. base of Caucasus Mts., midway between Black and Caspian seas; distributing center for Transcaucasia; pop. 347,000; univ.; hot springs; r.r. connections, **664.**
**Tiger, 3498–9;** altitude range, *picture,* **397;** belongs to cat family, **658;** foot, *picture,* **1323.**
**Tiger beetle, 368, 371,** *pictures,* **367, 370, 1782.**
**Tiger butterfly, 546.**
**Tiger cowry shell,** *picture,* **3203.**
**Tiger lily, 2009;** pollen grain of, *picture,* **1309.**
**Tiger moth,** caterpillar of, **661.**
**Tiger top shell,** *picture,* **3203.**
**Tig'lath-Pile'ser I,** reigned about 1120–1105 B.C. One of greatest Assyrian conquerors and builders; claimed to have conquered 42 countries.
**Tiglath-Pileser III** or **IV,** reigned 745–727 B.C., Assyrian king, usurper, who subdued Babylonia, Syria, and Media; takes Damascus, **957.**
**Tigranes** (*tī-grā'nēz*) (about 95–55 B.C.), king of Armenia, defeated by Pompey, **2878.**
**Ti'gris,** great r. of w. Asia, flowing 1150 mi. to Persian Gulf, **3499, 2200–1;** basket boats, **445,** *picture,* **443;** in World War, **3795.**
**Til'burg,** Netherlands. Mfg. town 38 mi. s.e. of Rotterdam; pop. 62,000; textiles, tanned leather, iron products.
**Tilden, Samuel J.** (1814–86), Amer. statesman, b. Lebanon, N.Y.; gov. of N.Y., 1874; defeated for president (1876), **1610–1.**
**Tilefish, 1279.**
**Tiles, 505, 531,**
**Tiller,** of ship, **3208.**
**Tilley, Sir Samuel Leonard** (1818–96). Canadian statesman, introduced Canadian protective tariff.
**Til'ly, Johann Tserklaes, Count of** (1559–1632), commanding general of Catholic League in Thirty Years' War, **3488, 1554, 1443.**
**Tilsit** (*tĭl'sĭt*), mfg. and commercial city in E. Prussia on Memel R.; pop. 40,000; captured by Russians in World War; Peace of (1807), **2396, 85.**
**Timber.** *See in Index* **Lumber and timber.**
**Timberman beetle,** *picture,* **367.**
**Timber wolf, 3774, 3775.**
**Timbre** (*tĭm'bēr* or *tăn'br*), in music, **2383, 3278;** in human voice, **3657.**
**Timbuktu** (*tĭm-bŭk'tų*) or **Timbuctoo,** Fr. W. Africa, famous trading post 9 mi. n. of Niger R. at edge of Sahara; pop. 5000; **3384, 2507, 3105.**
**Time, 3500–2;** calendar, **573–5;** clocks and watches, **797–803;** daylight saving, **969;** geologic, **1418, 1420,** *picture,* **1419;** noon signals, **2551.**
**'Time, the Value of',** a Little Talk by Arthur Mee, **3503.**
**Time lock, 2043.**
**"Times that try men's souls," 2626.**
**Timing gear,** automobile, **280, 282.**
**Timisioara** (*tē-mē-shô-ä'rä*), Hungary. Same as **Temesvar.**
**Ti'mon of Athens.** Famous misanthrope, living during Peloponnesian War; at first rich and generous, later soured by abandonment of friends when fortune failed him; subject of Shakespeare's 'Timon of Athens'.
**Timor** (*tē-mōr'*), isl. of Malay Archipelago, easternmost and largest of Lesser Sunda Isls.; 12,500 sq. mi.; n.e. half belongs to Portugal, s.w. half to Netherlands; *map,* **1073.**
**Tim'othy.** Disciple and assistant of St. Paul (Acts xvi, 1, xvii, 14) who addressed to him the two epistles Timothy I and II; the first of these is a pastoral letter upon church order, meant for the Asiatic Christian communities around Ephesus, while the 2d is a letter of counsel to Timothy.
**Tim'rod, Henry** (1829–67), Amer. poet, b. Charleston, S.C. ('Charleston'; 'At Magnolia Cemetery'); quoted, **114.**
**Timur** (*tē-mųr'*) **Leng** or **Tamerlane,** "Timur the Lame" (1336–1405), Mongol conqueror whose short-lived empire stretched from n. India to Asia Minor, **2285–6;** raids Damascus, **956;** invades India, **1752;** Samarkand cap., **3556;** checks Turks at Angora, **3559.**
**Tin, 3504;** in Africa, **41;** alloys, **428, 1973, 515;** Bolivia, **449, 450;** cans, **632;** in fireproof cloth, **1263;** melting point, **1362;** sought by Phoenicians, **1151;** pins, **2807;** plate, **3723;** Siam, **3227;** Singapore industry, **3243;** used to "weight" silk, **3238–9;** in Wales, **3664.**
**Tinctures,** in heraldry, **1639.**
**Tindale, William.** Same as **Tyndale.**
**Tinder box, 2170.**
**Tinfoil, 3504.**
**Tinstone,** an ore, **3504.**
**Tintoretto** (*tēn-tō-rĕt'tō*), "little dyer," popular name, from his father's trade, of the great Venetian painter Jacopo Robusti (1518–94), **2630, 1851, 2997.**
**Tiny Tim,** in Dickens' 'Christmas Carol', **760–2.**
**Tippecanoe** (*tĭp-ĕ-kȧ-nọ'*), small r. in n. Indiana; flows s.w. 200 mi. to Wabash R.; *map,* **1758.**
**Tippecanoe, battle of, 3452, 1594, 3671.**
**Tippera'ry,** agricultural county in s. Ireland; 1661 sq. mi.; pop. 152,000; cap. Tipperary; story, 'Fairy Calf of Tipperary', **1812–4.**
**Tipple house,** of coal mine, *picture,* **815.**
**Tippu Sahib** (*tē-pų' sä'hĭb*) (1753?–99). Indian potentate, son of Hyder Ali, whom he succeeded as sultan of Mysore 1782; fought Brit. invasion but defeated and slain in his cap. of Seringapatam.

**Tirana** (*tē-rä'nä*). Cap. of Albania since 1921; pop. 12,000; 18 mi. directly e. of Durazzo.
**Tire,** pneumatic, **3075–6,** *pictures,* **3073–5.**
**Tirida'tes** (238–314), king of the Armenians, **211–2.**
**Tirol.** *See in Index* **Tyrol.**
**Tirpitz** (*tir'pitz*), **Alfred von** (born 1849). Ger. lord high admiral 1911–16; active in advocating and creating powerful Ger. navy; supported policy of ruthless submarine warfare in World War; rejection of certain recommendations brought his resignation in March 1916.
**Tir'su River,** Sardinia, **3127.**
**Tiryns** (*tī'rĭns*), Greece, city in Argolis; destroyed 468 B.C.; excavations of Schliemann revealed finest palace of Mycenaean Age in Greece; **28, 29,** *map,* **27.**
**Tishri** (*tiz'rī*) or **Tisri,** month in Jewish calendar, **2479.**
**Tisiphone** (*tĭ-sĭf'ō-nē*), in Gk. myth., one of Furies, **1382.**
**Tisquan'tum,** Indian chief. Same as **Squanto.**
**Tissot** (*tē-sō'*), **James Joseph Jacques** (1836–1902). Fr. painter and illustrator; 'Life of Christ', series portraying with minute realism scenes of Palestine.
**Tissue,** of animals; composed of cells, **672;** connective (bone, cartilage, and ligaments), **452, 3245;** epithelial (skin, mucous, and glandular), **3245;** muscular, **2372–3;** nervous, **2437.**
**Tissue,** of plants, **2824, 3532, 1982,** *picture,* **3531;** composed of cells, **672.**
**Tissue paper, 2667, 2673.**
**Tisza** (*tē'zä*), **Stephen, Count** (1861–1918). Hungarian statesman, premier at outbreak of World War; son of Count Koloman Tisza (1830–1902), one of chief builders of Hungarian monarchy.
**Tisza River.** Same as **Theiss.**
**Titania** (*tī-tā'nĭ-ä*), in Eng. folklore, queen of the fairies, **1219, 2230.**
**'Titanic',** ocean liner, **1721.**
**Tita'nium,** dark gray metallic element, **4042.**
**Ti'tans,** in Gk. myth., rebellious giant children of Uranus, **3607;** dethroned by Zeus, **3838;** Prometheus, **2921.**
**Tithe.** Tax of one-tenth, usually on land; levied, especially for religious purposes, from anc. times; still survives in England.
**Tithonus** (*tĭ-thō'nŭs*), in Gk. myth., mortal husband of the goddess Aurora (Eos), the Dawn, **259.**
**Titian** (*tĭsh'ăn*) (Tiziano Vecellio) (1477–1576), Ital. painter, **3504–5;** works by, *pictures,* **2763, 3505.**
**Titicaca** (*tē-tē-kä'kä*), **Lake,** largest lake of S. Amer., between Peru and Bolivia; 130 mi. by 30 mi.; **449,** *maps,* **3288–9,** *pictures,* **448, 2742.**
**Titlark** or **pipit, 3505,** *picture,* **419.**
**Titmouse,** bird family, **3505–6;** chickadee, **728,** *picture,* **420.**
**Ti'tus.** Gk. disciple and companion of the Apostle Paul (Gal. ii, 1, 3) who addressed an epistle to him (the 17th book of the New Testament).
**Titus, Flavius Sabinus Vespasianus** (40?–81 A.D.), Rom. emperor; succeeded his father Vespasian 79 A.D.; humane and able ruler; captures Jerusalem, **1891;** dedicates Colosseum, **3050;** gladiatorial show, **1466;** triumphal arch, **3055,** *picture,* **3051.**
**Titusville,** Pa. City 42 mi. s.e. of Erie; pop. 8432; center of oil and natural gas region; first oil well in U.S. drilled here August 1859.
**Tiumen,** Siberia. Same as **Tyumen.**
**Tivoli** (*tē'vō-lē*), Italy. Picturesque walled town 18 mi. n.e. of Rome at falls of R. Anio; pop. 15,000; many antiquities; anc. Tibur, favorite resort of Romans.
**Tiw,** Norse god. Same as **Tyr.**
**Tlaxcala** (*tläs-kä'lä*), Mexico. State in s.e.; 1534 sq. mi.; pop. 187,000; cap. Tlaxcala.
**Tlemçen** (*tlĕm-sĕn'*), Algeria. Trading town near frontier of Morocco; pop. 40,000; former center of Moorish art and culture.
**Tlinkits** or **Thlingits** (*tlĭn'gĭtz*), group of N. Amer. Indian tribes, **1767, 78.**
**T N T** or **trinitrotoluol, 1212, 814.**
**Toad, 3506–7;** evolutionary position, **128, 129;** eye, *picture,* **1215;** length of life, **126;** reproduction, **1210;** tongue structure, **3513.**
**Toadflax, ramsted,** or **butter and eggs.** A genus of herbaceous plants native to the Old World; the common toadflax, a roadside weed somewhat like a snapdragon, has been introduced into Amer. and has escaped from gardens; the flowers, grown on racemes, are pale yellow except for an orange ridge on one lobe of the corolla and have a short spur.
**Toadstools, 2374, 1382.**
**Tobac'co, 3508–10;** Cuba, **936,** *picture,* **937;** Egyptian cigarettes, **1097, 3509;** France, **1346;** licorice, **1995;** as money, **2281;** Perique, **2070;** in Philippines, **2769;** Porto Rico, **2885, 2886,** *picture,* **2887;** Raleigh popularizes, **2975;** St. Louis, **3109;** Sumatra, **3391.** —*U.S.,* **3508, 3509, 3510;** Conn., **864,** *picture,* **865;** Ky., **1917, 1918;** N.C., **2519;** Va., **3647, 3648, 3019.**
**Toba'go** or **Tabago,** one of Brit. W. Indies; 144 sq. mi.; pop. 11,729; exports sugar, coffee, rubber, tobacco, cacao; **3541,** *map,* **2514–5.**
**"To be or not to be," 1570.**
**To'bit,** apocryphal book of Old Testament, **390.**
**Tobog'ganing, 3756,** *picture,* **3755.**
**Tobolsk** (*tō-bŏlsk'*). Govt. of w. Siberia; 535,739 sq. mi.; pop. 2,086,000; rich agricultural dist.; makes paper, cloth, leather, and glassware; cap. Tobolsk (25,000).
**Tocantins** (*tō-kän-tēnz'*), large r. in cent. Brazil, flowing n. 1700 mi. through undeveloped country to Atlantic Ocean, *map,* **494.**
**Tocmeto'ne,** Indian princess, **2447–8.**
**Tocqueville** (*tōk-vēl'*), **Alexis, Comte de** (1805–59). Fr. statesman and political philosopher; wrote 'Democracy in America', the first systematic analysis of democratic institutions in U.S.
**Toe, 1322;** how to bandage, *picture,* **1267.**
**Toe-nail, 3246.**
**To'ga,** Roman garment, **897,** *picture,* **898.**
**Toggenburg goat, 1477.**
**Toggle joint,** *picture,* **3515.**
**Togo** (*tō'gō*), **Heihachiro, Count** born 1847), Japanese admiral, **3098.**
**Togo,** territory in w. Africa, on Gulf of Guinea; 33,700 sq. mi.; pop. 1,032,000; became Ger. colony 1884; divided between France and Gt. Brit. under mandate from League of Nations; **40, 3796,** *maps,* **40–1.**
**Tokay** (*tō-kā'*), Hungary, town 130 mi. n.e. of Budapest; pop. 6000; wine, **271.**
**Tokay grape, 1502.**
**Tokelau** (*tō'kē-lou*) or **Union Islands,** small group in Polynesia, **2621, 2624,** *map,* **2624–5.**
**Tokugawa** (*tō-kų-gä'wä*). Family name of the Japanese shoguns or "mayors of the palace," 1600–1868; made Tokyo capital of Japan.
**Tokugawa, Prince Yoshinobu** (1837–1913). Jap. statesman, last of the shoguns; after holding shogunate for only a year he resigned (1867), thus opening the way for friendly relations between Japan and European powers.
**Tokyo** (*tō'kē-ō*), Japan, cap. and largest city of the Japanese Empire; pop. 2,250,000; **3510–1,** *pictures,* **1865.**
**Tole'do,** Ohio, important Great Lakes port, near mouth of Maumee R. at w. end of Lake Erie; pop. 245,000; **3511–2;** early growth, **2568.**
**Toledo,** Spain, former cap. of kingdom, on Tagus R., 45 mi. s.w. of Madrid; pop. 22,000; medieval Gothic art and architecture; **3300;** swords, **2278.**
**Toledo, Mts. of** (Montes de Toledo). A rugged group of cent. Spain s. of the city of Toledo; highest point 4750 ft.
**Toledo, University of.** Municipal co-ed. institution at Toledo, Ohio; founded 1872; arts, engineering, pharmacy, education, law.
**Toledo War, 2572.**
**Toleration Act,** England, **2937.**
**Tol'fa,** town in s. Italy; pop. 4500; alum-stone mines, **104.**
**Toll-roads, 3024.**
**Tolosa** (*tō-lō'sä*), **battle of** (1212), **3304.**
**Tolstoy** (*tōl-stoi'*), **Count Leo** (1828–1910), Rus. writer and social reformer, **3512;** philosophical anarchist, **3269;** place in Rus. literature, **3097, 2541.**
**Tolu',** Colombia, small town 65 mi. s. of Cartagena; district supplies balsam, **2728.**
**To'luol,** obtained from coal-tar, **814.**
**Tom, Mt.** Hill in w. Massachusetts, near Northampton; 1214 ft.
**Toma'to, 3512–3;** food value, **2238;** vitamins in, **3652;** when and how to plant, **1397.**
**Tombig'bee River,** one of chief rivers in Alabama; 450 mi. to junction with Alabama R.; **72.**
**'Tom Brown's School Days',** story of Eng. public-school life, by Thomas Hughes (1857); a children's classic; courage of Tom Brown, **907.**
**'Tom Jones',** a novel by Fielding; hero is a free-living, exuberant young man, supposedly typical of 18th cent. England; **2540.**
**"Tommy Atkins,"** nickname for the Eng. soldier; popularized by Kipling, **1927.**
**Tompkins, Daniel** (1774–1825), Amer. statesman, b. Fox Meadows, N.Y.; gov. of New York 1807–17; vice-president of U. S., **2306, 3636.**
**'Tom Sawyer',** novel of boy life on Mississippi, by Mark Twain, **3569;** Tom's cure for warts, **3673.**
**Tomsk** (*tŏmsk*), Siberia, cap. and commercial center of agricultural and mining province of Tomsk in s.w.; pop. 117,000; univ.; **3229.**
**Tom Thumb,** a famous dwarf, **510.**
**"Tom Thumb,"** Peter Cooper's locomotive, *picture,* **2044.**
**Tom-tit,** a tufted titmouse, **3506.**
**Ton,** unit of weight, **3714, 3715;** metric, **2206.**
**Tonawan'da,** N. Y. Lumber market on Niagara R. and Erie Canal 10 mi. n. of Buffalo; pop. 10,068; steel products, lumber and lumber products.
**Tone,** in music, **3278.**
**Tonga** (*tŏn'gä*) or **Friendly Islands,** chain of isls. in s. Pacific e. of Fiji Isls., under Brit. protection; 385 sq. mi.; pop. 25,000, chiefly Polynesians; export copra; **2621, 2623, 2624,** *map,* **2624–5;** native game, *picture,* **2622.**
**Tongue, 3513;** of chameleons, **685,** *picture,* **686;** fly, *picture,* **1312;** importance in speech, **3656;** moth, *picture,* **547;** sense of taste, **3440;** of snail, **3256;** snakes, **3258;** spider, *picture,* **3323;** toad, *picture,* **3507;** toucan, **3520;** woodpecker, **3780,** *picture,* **3781.**
**Ton'ka bean, 3619;** cumara another name, **2546.**
**Tonkin** (*tŏn-kĭn'*) or **Tongking,** protectorate in n. Fr. Indo-China, 46,400 sq. mi.; pop. 6,470,000; cap. Hanoi; **1777.**

**Tonnage,** of ships, **3220.**
**Tonopah** (*tō'nō-pä*), Nevada, mining town; pop. 4144; **2445, 2446.**
**Tonsils, 1714.**
**Ton'sure, 764.**
**Tonty** or **Tonti** (*tôn-tē'*), **Henri de** (1650?–1704?), Fr. explorer, b. Italy, LaSalle's companion on explorations down Mississippi R., **1964, 1965, 1736;** and Louis Jean, story, **726–8.**
**Tools, 3514–6;** agricultural, **43;** anc. Roman, *pictures,* **3045;** high-speed alloys, **99, 3548;** importance in civilization, *picture,* **772;** Stone Age, **3360–1;** used by digger wasp, **3692–3.**
**Toombs** (*tụmz*), **Robert** (1810–85), Amer. statesman and Confederate general, b. Washington, Ga.; for short time Confederate sec. of state; refused to take oath of allegiance to U.S. govt. after Civil War and never restored to full rights of citizenship; opposes admission of California as free state, **855.**
**Toothache,** caused by decay, **3452, 3454;** how cured, in India, *picture,* **1750.**
**Toothed whales, 3724, 3726.**
**Tooth shell, 3202, 3945.**
**Toothwort,** a leafless European herb parasitic upon roots of other plants, *picture,* **2678.**
**Top, gyroscopic, 1555.**
**To'paz,** a semi-precious stone, **1409, 1410;** relative hardness, **2248.**
**Tope'ka,** Kan., state cap., 57 mi. w. of Kansas City on Kansas R.; pop. 50,022; headquarters of Santa Fe R.R.; Washburn College; one of "Free Towns" settled 1854 by eastern anti-slavery men; capitol, *picture,* **1911;** industries, **1911.**
**Toplady, Augustus Montague** (1740–78). Eng. clergyman, author of hymn 'Rock of Ages'.
**Topograph'ic surveying, 3398.**
**Topsy.** In Mrs. Stowe's 'Uncle Tom's Cabin', mischievous, ignorant little imp of a slave girl; asked if she knows who made her, replies "Nobody. I 'specs I just growed."
**Torah** (*tō'rä*) (Heb. "law"), first five books of Bible, **2333.**
**Tordesillas** (*tôr-dā-sēl'yäs*), **Convention of.** Treaty between Spain and Portugal, regulating their rights of discovery and conquest; signed June 7, 1494 at Tordesillas, Spain, because of dissatisfaction of Portugal with "Line of Demarcation"; by its terms Brazil, then undiscovered, later fell to Portugal.
**Torgau** (*tôr'gou*), Germany. Historic town on Elbe, 30 mi. n.e. of Leipzig; prominent in Reformation; victory of Frederick the Great over Austrians 1760 (Seven Years' War); in 1814 taken by Germans after siege of 3 months.
**To'ric lens, 3310.**
**Torii** (*tō'ri-ē*), Jap. sacred gateway, usually entrance to Shinto temple, *picture,* **1870.**
**Torino** (*tō-rē'nō*). Ital. name for **Turin.**
**Tormes** (*tôr'mās*) **River,** rises in mts. of cent. Spain, flows n.w. 150 mi. to Duoro R.; Salamanca on, **3300.**
**Torna'do, 3366;** causes waterspouts at sea, **3701.**
**Torneo** (*tôr'nē-ō*) **River,** rises in Swedish Lapland and flows s.e. 250 mi. to Gulf of Bothnia, **3402,** *map,* **2531.**
**Toron'to,** Ontario, cap. and chief city; pop. 500,000; **3516–7;** Mackenzie first mayor, **2102;** Yonge Street, *picture,* **609.**
**Toronto, University of,** at Toronto, Ontario; co-ed., non-sect.; founded 1827 (present name 1849); arts, science, engineering, medicine, dentistry, law, agriculture, forestry, etc.; **3517.** —*Federated institutions:* **Knox College,** Presb.; theology; opened 1844; **St. Michael's College,** Cath.; founded 1851; **Trinity College,** Church of England; chartered 1852; **Victoria Univ.,** Meth. in origin but non-sect.; theology; incorporated 1841 (opened 1843); **Wycliffe College,** Anglican; founded 1879; theology.
**Torpe'do boat, 2423.**
**Torpedo boat destroyer, 2423, 3378, 3803.**
**Torpedoes,** naval explosive devices, **3517–20, 2423–4,** *pictures,* **2427;** contain gyroscopes, **1555;** use by submarines, **3376.**
**Torpedo-fish, 3517;** electric eel, **1089–90.**
**Torquay** (*tôr-kē'*), England. Seaport and watering place on coast of Devonshire; pop. 39,000; landing place of William of Orange 1688.
**Torquemada** (*tôr-kā-mä'dä*), **Tomás de** (1420–98), Span. Dominican friar, fanatic organizer of Span. Inquisition; burnt at least 2000 persons; incited expulsion of Jews from Spain; **1780.**
**Torrens system.** System for transfer of real estate by registration in place of cumbersome method of deeds; titles to all property accepted for registration guaranteed by state and transfer effected by simple registration of fact with proper official; first used in Australia 1857; adopted in many parts of British Empire and states of U.S.
**Tor'res, Luis de,** Span. explorer, **266.**
**Torres Strait,** between Cape York Peninsula, Australia, and isl. of New Guinea; **2453, 266,** *maps,* **264–5.**
**Torricelli** (*tôr-rē-chĕl'lē*), **Evangelista** (1608–47), Ital. physicist; inventor of mercurial barometer; **2787, 333.**
**Torrid zone.** *See in Index* **Tropics.**
**Torrington,** Conn. Mfg. borough 23 mi. w. of Hartford on Naugatuck R.; pop. 20,623; skates, machinery, brass products, woolen goods; birthplace of John Brown.
**Tortoise** (*tôr'tĭs*), **3520, 3562, 131;** classified, **2997;** foot, *picture,* **1323;** in Galapagos Isls., **1079;** musk tortoise, **3563;** shell, **3520, 1680.**
**Tortoise Islands.** Same as **Galapagos.**
**Tortoise shell, 3520, 1680.**
**Torture,** as punishment for crime, **2918–9, 3344.**
**To'ry,** in Amer. colonies, **2869–70, 3002.**
**Tory party** (England), **2869;** Catholic Emancipation Bill, **2706;** oppose repeal of Corn Laws, **1155.** For later history *see in Index* **Conservative party.**
**Toscanelli dal Pozzo** (*tŏs-kä-nĕl'lē däl pŏt'sō*), **Paolo** (1397–1482). Ital. astronomer; believed western route to the Indies possible, and imparted views to Columbus.
**Toscanini** (*tŏs'kä-nē'nē*), **Arturo** (born 1867). Ital. operatic conductor, principal conductor 1908–15 Metropolitan Opera House, New York City.
**Totapotamoy,** Indian chief, **3019.**
**To'tem pole,** *picture,* **74.**
**Toucan** (*tụ-kän'*), a bird, **3520,** *picture,* **410;** foot, *picture,* **409.**
**Touch,** sense of, **3520–1;** Montessori method of training, **2315;** nerve-endings, **3246.**
**Touchstone,** clown in 'As You Like It', **225.**
**Toul** (*tụl*). Strongly fortified town in n.e. France, 15 mi. w. of Nancy; pop. 14,000; important in Middle Ages; taken by Germans 1870, and threatened by them 1914.
**Toulon** (*tụ-lôn'*), France, important seaport and naval station on Mediterranean; pop. 105,000; 1707, unsuccessfully besieged by Allies under Prince Eugene; 1744, Brit. fleet defeated by French and Spanish; 1793, Napoleon defeated England and Spain, his first memorable victory; **1344.**
**Toulouse** (*tụ-lụz'*) (anc. Tolosa), France. Cathedral city, commercial and mfg. center in s.w. on Garonne R.; pop. 150,000; univ.
**Touraine** (*tụ-rān'*), former province of France corresponding to present dept. of Indre et Loire; cap. Tours; *map,* **1351;** united with Eng. crown, **1633.**
**Tourcoing** (*tụr-kwăn'*), Francc. Mfg. town 8 mi. n.e. of Lille; pop. 83,000; woolens, carpets, upholstering materials; captured by Germans 1914.
**Tourgée** (*tụr-zhā'*), **Albion Winegar** (1838–1905). Amer. novelist and Civil War soldier, b. Williamsfield, Ohio; lived in South during Reconstruction period and wrote novels about it ('A Fool's Errand'; 'Bricks without Straw').
**Tour'maline,** a semi-precious stone, **1411;** polarization of light, **2000.**
**Tournai** or **Tournay** (*tụr-nā'*), mfg. city of s.w. Belgium on Scheldt R. near Fr. border; pop. 36,000; Brussels carpets, textiles, porcelain; devastated by Ger. invasion 1914; **3434, 374.**
**Tour'nament,** in Middle Ages, **1934–5;** at Camelot, story, **3069–70;** of Ashby, story, **3152–3.**
**Tourniquet** (*tụr'nĭ-kĕt*), bandage, **1270.**
**Tours** (*tụr*), city in w.-cent. France, on Loire R.; pop. 74,000; makes silk stuffs, chemicals, iron and steel; occupied by Germans 1871; formerly cap. of Touraine; **2047.**
**Tours, battle of** (732 A.D.), **697, 2278.**
**Toussaint L'Ouverture** (*tụ-săn' lụ-vĕr-tür'*), **Pierre Dominique** (1746?–1803), Haitian negro rebel and liberator; threw off Fr. rule and became president and dictator of Haitian republic 1801; captured by treachery; died in Fr. prison; **1561.**
**Tow** (*tō*), fiber, **1292, 1905.**
**Tower,** in architecture, **188, 377;** leaning "tower" of Pisa, **2810,** *picture,* **2811.** *See also in Index* **Bell-tower.**
**Tower Bridge,** London, **507, 2048–50,** *picture,* **2056;** Henry VI murdered, **1635;** Raleigh in, **2976.**
**Towers of Silence,** Bombay, India, **451.**
**Tow'hee,** a finch, **1241.**
**Town meetings, 3521;** in Rhode Island, **3008–9.**
**Townshend** (*town'sĕnd*), **Charles** (1725–67). Eng. politician; chancellor of the exchequer under Pitt; author of Townshend duties.
**Townshend, Sir Charles Vere Ferrers** (born 1861), Brit. general; captured by Turks in World War, **3795.**
**Townshend duties,** taxes levied on Amer. colonies, **3001.**
**Township** and **town,** units of local govt., **3521;** in Connecticut, **868.**
**Township,** unit of public land surveys, **3521, 1960.**
**Towton,** England. Village in Yorkshire, 11 mi. s.w. of York; decisive victory of Yorkists under Edward IV and over Lancastrians 1461 (Wars of the Roses).
**Toxicoden'dron,** poison of poison ivy, **2852.**
**Tox'in,** poisonous organic substance, **151;** formed by bacteria, **1450.**
**Toyn'bee, Arnold** (1852–83), Eng. pioneer in social settlement work, **3269.**
**Toyokuni** (*tō-yō-kụ'nē*) (1768–1825), Japanese artist, **1876.**
**Toys, 3521–3;** dolls, **1025–6;** gyroscope, **1555–6;** in Japan, **1872;** kaleidoscope, **1907;** kites, **1930–2;** Tyrol mfrs., **3574.**
**Trachea** (*trā'kē-ä*), air passage or windpipe of an animal; in caterpillars, **661;** in cranes, **915;** in insects, **1787;** in man, *picture,* **2083.**
**Trachodon** (*trā'kō-dŏn*), a prehistoric monster reptile, **134.**

**Track sports,** 252, *picture,* 831.
**Trac'tor, farm,** 274, 3732, *pictures,* 47, 605; tanks developed from, 3433.
**Trade.** *See in Index* **Commerce.**
**Trade, Board of,** 440–1.
**Trade and Navigation Acts,** 3000, 3001.
**Trade-marks,** 884.
**Trade rat,** 2977.
**Trade routes:** Atlantic, *map,* 255; Asia (anc.), 232, 2648; Caribbean Sea, 644; Great Lakes, *map,* 1511; Khyber Pass, 31, 1751; Pacific Ocean, *map,* 2624–5; Mediterranean, 2194; Panama Canal, 2663; Persia, 2734; sea route to India, 640, 1392–3, 1763; spice trade, 3317.
**Trade schools,** 3655–6, 3140–1.
**Trade unions,** 1947. *See also in Index* **Labor organizations.**
**Trade winds,** 3750, *picture,* 3751; affect rainfall, 2973.
**Trafalgar** (*trà-fàl'gär*), cape of s. Spain at n.w. entrance to Strait of Gibraltar; battle of (1805), 2435–6, 2427–8, 2394.
**Trafalgar Square,** London, 2055, *picture,* 2052; Washington statue, *picture,* 2055.
**Trag'acanth,** a gum, 1552; in medical preparations, 1042.
**Tragedy** (*trăj'ĕ-dĭ*), English, 1034; Greek, 1032, 1536–7; Latin, 1966, 1967.
**Trailing arbutus,** 173.
**Trailing myrtle,** 2385.
**Trajan** (*trā'jăn*) (Marcus Ulpius Trajanus) (51–117 A.D.), Rom. soldier-emperor; adopted son of Nerva; humane able ruler, great builder, conqueror of Dacia, Armenia, and Parthia; 3047, 3303; empire reaches greatest extent, *map,* 3042; statue, *picture,* 3043.
**Trajan, Column of,** 1202, *picture,* 1533.
**Tramp steamers,** 3218.
**Tram silk,** 3238.
**Trans-Ande'an railroad,** 737, 3288, 123.
**Trans-Cas'pian railway,** 3556.
**Transcauca'sia.** *See in Index* **Caucasia.**
**Transcenden'talism,** in U.S., 113, 1142.
**Tran'sept,** in architecture, 181, *diagram,* 186.
**Transformer,** device for changing voltage of electric current, 3523–4; in street railway systems, 3371.
**Tran'sit,** a telescope mounted to rotate vertically; in astronomical observations, 2551, *picture,* 3500; in surveying, 3398.
**Transitive verb,** 3627.
**Transits of Mercury and Venus.** Passage of either planet between the earth and the sun; seen in telescopes as passage of black dots.
**Transjordania.** Same as **Kerak.**
**Transmigra'tion of the soul,** Buddhist doctrine, 525; Hindu, 1651; taught by Pythagoras, 2941.
**Transmis'sion,** of automobile, the clutch, gears, and differential, 283–7.
**Transmitter,** in radio telegraphy, 3760, 3762; telegraph, 3456, *pictures,* 3457; telephone, 3458, *picture,* 3459.
**Transmuta'tion of elements,** hypothetical change of chemical elements into others; believed possible by alchemists, 710; possibility denied by 19th cent. chemists, 2959; revival of idea in 20th cent., 256–7, 711.
**Transplanting,** of fruit trees, 1377, 1379, *pictures,* 1378; garden plants, 1395.
**Transporta'tion,** 3524–6, 3998; airplane, 63; automobile, 274–87; balloon, 310–20; bicycles and motorcycles, 391; canals, 625–7; caravans, 3105–6; commerce, 852–3; common carriers, 2932; locomotive, 2043–4, 3348–52; monorail, 1555; oil tank cars and pipe lines, 2754; Panama Canal, 2663; railroads, 2962–72; refrigeration, 2990, 1377–8; roads and streets, 3023–7; ships, 3207–20; street railways, 3370; subways, 3550, 3551. *See in Index* chief topics above by name, *also* under names of countries.
**Trans-Siberian Railway,** 2963, 3088, 3228, 2135.
**Transubstantia'tion,** Rom. Cath. doctrine of, 764.
**Transvaal** (*trăns-väl'*), province of Union of S. Africa; 110,426 sq. mi.; pop. 1,700,000; 3526–7, 3280–3, *maps,* 3282, 40–1; Boer War, 446–7, 3282; Botha, 475; locust swarms, *picture,* 1504; Smuts, 3254.
**Transver'sal,** in geometry, 1424, 1426.
**Transylva'nia,** region in n.w. Rumania, formerly part of Hungary; 22,312 sq. mi.; pop. 2,680,000; 3081, 3080, *maps,* 308, 271; peasant costume, *picture,* 273.
**Transylvania College.** At Lexington, Ky.; co-ed., non-sect.; founded 1798; arts and science.
**Transylvanian Alps,** range of Carpathian Mts. in cent. Rumania, formerly on Hungarian boundary, 3081, 1190, *maps,* 271, 308.
**Trapani** (*trä'pä-nē*). Seaport and industrial center on n.w. coast of Sicily; pop. 61,000; anc. Drepanum, important Carthaginian naval station in First Punic War; Rom. fleet defeated 250 B.C.
**Trap-door spiders,** 3322, 3324.
**Trappists,** Cistercian monks, 2299, *picture,* 2302.
**Traps and trapping,** 3527–9; trapper's camp, *picture,* 1389.
**Trasimene** (*trā-sĭ-mē'nē*), **Lake,** in cent. Italy; battle (217 B.C), 1575.
**Travelers' tree** or **ravenala,** a tall, fan-shaped tree of the banana family, 2105.
**Traverse, Lake,** on boundary of S.D. and Minn., 2986, *map,* 3296.
**Traverse City,** Mich. Port and resort on Traverse Bay, arm of L. Michigan 50 mi. n.e. of Manistec; pop. 10,925; woodenware, chairs, iron products.
**Trav'ertine,** an Ital. limestone, 2010.
**Trawl-line,** a fishing device, 1283–4.
**Treason,** of Benedict Arnold, 219–20; Aaron Burr accused of, 542–3; punishment for, 2919.
**"Treason Speech"** of Patrick Henry, 1638, *picture,* 1881.
**'Treasure Island',** story by Stevenson, 3356, 1922.
**Treasure State,** 3347.
**Treasury, Comptroller of,** U.S., 3598.
**Treasury Department,** U.S., 3598, 555, *chart,* 3597; building, *picture,* 2284; Bureau of Printing and Engraving, 2284; Coast Guard, 3598, 1995; Farm Loan Bureau, 1224; Federal Reserve system, 1230; independent treasury established, 3616; mint, 2258–9; Public Health Service, 1612; standard weights and measures, 3714; War risk insurance, 1792.
**Treat, Robert** (1622–1710), Amer. colonial soldier and statesman, for 13 years gov. of Connecticut, 868; founds Newark, 2448.
**Treaties,** 3529–30; of arbitration, 172, 521; how made in U.S., 3594; registration with League of Nations, 1974, 3530. For list of famous treaties, *see* following page.
**Treaty ports,** in China, 746.
**Treb'ia** (modern Trebbia) **River,** tributary of Po; battle (218 B.C.), 1575.
**Trebizond** (*trĕb'ĭ-zŏnd*) (anc. Trapezus), Asia Minor, seaport on Black Sea; pop. 55,000; varied mfrs.; former center of transit trade between Europe and Persia; cap. of empire of Trebizond 1204–1461; taken by Russia 1916; recaptured by Turks in 1918; 434, 2734, 3795.
**Tree, Sir Herbert Beerbohm** (1853–1917). Eng. actor-manager, half-brother of Max Beerbohm; famous for elaborate revivals of Shakespeare's plays.
**Tree cabbage,** 553.
**Tree cricket,** 921.
**Tree-dwellers,** in Ceylon, 685; in New Guinea, 2451, *picture,* 2452.
**Tree-ferns,** 1232, 3533; in Ceylon, 684; in New Zealand, 2499.
**Tree-frog,** 1375, *picture,* 1373.
**Tree Planters' State,** 2430.
**Trees,** 3530–9; Arbor Day, 173; bark, 330; eucalyptus dries swamps, 1186–7; forests, 1327–31; giant redwoods and sequoias, 3175–6; leaves and their work, 1980–2, 1207; longevity, 2830; of N. Amer., 3533–4, 3873–4; oldest historical, 685; roots, 3063; tallest, 1186. *See in Index* **Forests; Lumber and timber; Plant life;** and the various trees, as **Ash, Buckeye,** by name.
**Tree sparrow,** 3308.
**Tree surgery,** 3532; grafting, 1377, *pictures,* 1379.
**Tree swallow,** 3399.
**"Tree wool,"** cotton, 904.
**Tre'foil** ("three leaved"). A name applied to the clovers and other plants having compound leaves in three parts; the bird's-foot trefoil is so called because it has clusters of pods resembling a bird's foot; the common bird's-foot trefoil (*Lotus corniculatus*) is abundant in European pastures and in the s. U.S. and is a nutritious food for stock.
**Treitschke** (*trītsh'kĕ*), **Heinrich von** (1834–96), Ger. historian, 1438.
**Trek,** of Boers, 3279, 3280.
**Tremato'da,** class of parasitic flatworms, 3945.
**Trembling poplar** or **quaking aspen,** 2880, *pictures,* 2879.
**Tremont' Street,** Boston, origin of name, 472.
**Trench, Richard Chenevix** (1807–86). Archbishop of Dublin, poet, and philologist ('The Study of Words'; 'English Past and Present').
**Trench warfare,** 3791, 3792.
**Trengganu** (*trĕng'gä-nu*), Malay state; 6000 sq. mi.; pop. 154,000; 2130.
**Trent.** A r. of cent. England flowing s. and n.e. 170 mi. to Humber; numerous canals to midland mfg. cities.
**Trent,** city in n.e. Italy; pop. 30,000; 3539–40.
**Trent, Council of** (1545–63), 2989, 2085, 764.
**Trent Affair,** in Amer. Civil War, 3539.
**Trent Canal,** Canada, 627, *picture,* 2583.
**Trentino** (*trĕn-tē'nō*), district in Ital. Tyrol, 3539, 3795.
**Tren'ton,** N.J., state cap. and greatest pottery center of U.S., 34 mi. n.e. of Philadelphia; pop. 119,289; 3540, *picture,* 2459; battle (1776), 3540, 3003.
**Trenton,** Ontario. Port at head of Bay of Quinte 95 mi. e. of Toronto; pop. 6000; terminus of Trent Canal; hydro-electric, acid, and chemical works; lumber interests.
**Trepang'** or **sea-cucumber,** an animal related to starfish, 3165.
**Trepan'ning** or **trephining.** Surgical operation consisting in removal of disk from skull for purpose of relieving pressure, removing tumors, etc.
**Treves** (*trēvz*) or **Trier,** anc. city in W. Prussia, on Moselle R.; pop. 53,000; various mfrs.; imperial residence under later Rom. Empire; fine Rom. amphitheater, basilica, baths, and other remains; cathedral one of oldest in Germany; archbishop an imperial elector, 1675.
**Treviso** (*trā-vē'zō*) (anc. Tarvisium), Italy. City 16 mi. n. of Venice; pop. 44,000; textiles, metal ware; art center; city republic under Lombard League.
**Trev'ithick, Richard** (1771–1833), Eng. engineer and inventor; builds first moving steam engine, 2962, 2044, 1221, *picture,* 275.

**Trial,** by jury, **1904–5, 1633–4;** courts, **909–10;** medieval forms, **1905.**
**Trian'a,** suburb of Seville, **3182.**
**Tri'angle,** in geometry, **1426–7.**
**Triangle,** percussion instrument, **2383, 2591,** *picture,* **2382.**
**Triangula'tion,** method of surveying, **3397–8.**
**Trianon** (*trēä-nôn'*), palaces at Versailles, **3633.**
**Trianon, Treaty of** (1920), between Hungary and the Allied Powers, **1662, 1703.**
**Trias'sic period,** in geologic time, **1418, 1420,** *picture,* **1419.**
**Tribe,** origin of, **1223.**
**'Tribune, New York', 1538.**
**Trib'unes,** Rom. magistrates, **3043.**
**Tri'ceps muscle,** of arm, **2372.**
**Tricer'atops,** a three-horned prehistoric reptile, **134,** *picture,* **135;** ancestral type, *picture,* **137.**
**Trichina** (*tri-kī'nä*), a parasitic worm, **3814, 1671.**
**Trichinopoli** (*trik-i-nŏp'ō-lī*). Town of Madras, Brit. India, on Kaveri R.; pop. 120,000; cheroots, woven fabrics, hardware, jewelry.
**Trichino'sis,** a disease, **3814.**
**Trichop'tera,** insect order including caddis flies, **1788.**
**Tricolette** (*trik-ō-lĕt'*), a fabric, **804, 3240.**
**Tricolor, French,** originated by Lafayette, **1956.**
**Tricus'pid valve,** of heart, **1616.**
**Tri'dent,** three-pronged spear carried by Neptune, **2891.**
**Trier** (*trēr*). Same as **Treves.**
**Trieste** (*trē-ĕst'*) or **Triest,** Italy, most important city on the Adriatic; pop. 230,000; **3540, 272;** in World War, **3795, 3797.**
**Trifo'lium,** the clover genus of plants, **810.**
**Triglyph** (*trī'glĭf*), in architecture, *picture,* **180.**
**Trigonom'etry,** a branch of mathematics dealing primarily with the relations between the sides and angles of triangles; first treatise on, **2931.**
**Tril'lium,** a spring flower, **3540–1.**
**Trilobite** (*trī'lō-bīt*), an extinct crab-like animal, **1336, 3945;** abundant in Cambrian time, **1418.**
**Tril'ogy,** in Gk. drama, **1536.**
**Trimountaine,** early name for Boston, **472.**
**Trinidad',** isl. of Brit. W. Indies, 1863 sq. mi.; pop. 385,000; **3541;** asphalt, **234–5.**
**Trinidad,** Colo. City 78 mi. s. of Pueblo; pop. 10,906; center of stock-raising and farming interests; coal-mining and coke-mfg. district.
**Trinidad,** Cuba. Town 45 mi. s.e. of Cienfuegos and 5 mi. from its port, Casilda; pop. 41,000; exports sugar, coffee.
**Trinidad tea,** 3451.
**Trinitrotol'uol** (T N T), **1212, 814.**
**Trinity, doctrine of,** in theology, belief that there are three persons in God or the divine nature, the Father, Son, and Holy Ghost; Arian heresy, **763.**
**Trinity Church,** Boston, **471.**
**Trinity Church,** New York, **2490.**

## SOME HISTORIC TREATIES AND ALLIANCES

**Adrianople** (1829): Treaty following Russo-Turkish War of 1828–29, recognizing the independence of Greece.

**Aix-la-Chapelle** (1748): Terminated War of Austrian Succession.

**Amiens** (1802): Treaty between England and France, which gave a breathing spell in the wars of the French Revolution.

**Augsburg, Religious Peace of** (1555): Charles V granted toleration to Lutheran princes and cities in Germany.

**Berlin, Congress of** (1878): Revised in Turkey's favor treaty of San Stefano which ended Russo-Turkish War, 1877–78. Montenegro, Serbia, and Rumania made independent of Turkey; Bulgaria, while remaining under its rule, was given a Christian government, but with less territory than provided at San Stefano.

**Brest-Litovsk** (1918): Peace treaty forced upon Bolshevik Russia by victorious Germany, requiring the surrender of border states and the payment of an enormous indemnity.

**Brétigny** (1360): Afforded break in the Hundred Years' War between England and France. Edward III to renounce his claim to the French crown, and receive southern provinces in full sovereignty.

**Bucharest** (1913): Ended Second Balkan War.

**Cambray, League of** (1508): Formed against Venice by the Pope, the Empire, France, and Spain.

**Campo Formio** (1797): Between France and Austria, after Napoleon Bonaparte's first campaign in Italy.

**Clayton-Bulwer** (1850): Between Great Britain and the United States, providing that neither power should have exclusive control over any canal built across Panama isthmus or Nicaragua.

**Frankfort** (1871): Definitive treaty at end of Franco-Prussian War; France forced to surrender Alsace and much of Lorraine to Germany and pay an indemnity of $1,000,000,000.

**Ghent** (1814): Between United States and Great Britain, ending War of 1812.

**Guadalupe Hidalgo** (1848): Ending the war between Mexico and the United States; Mexico gave up all claim to Texas and ceded California, etc. (about 522,955 square miles) to the United States in return for $15,000,000.

**Hay-Pauncefote** (1901): Between United States and Great Britain, setting aside Clayton-Bulwer agreement, and allowing the United States to build and fortify the Panama canal although maintaining its neutrality.

**Holy Alliance** (1815): Declaration of impractical Christian brotherhood signed by Russia, Austria, Prussia, and other European powers (except Pope, Turkey, and Great Britain). It had no influence; the important body was the Grand Alliance which overthrew Napoleon and regulated Europe for some years afterward.

**Jay's Treaty** (1794): "Treaty of amity, commerce, and navigation" between the United States and Great Britain, which also settled the eastern boundary of Maine.

**Kanagawa** (1854): Following Perry's mission, Japan agrees to open certain ports to the United States; ends Japan's isolation.

**Lunéville** (1801): Treaty between France and Austria, following Bonaparte's second Italian campaign.

**Neuilly** (1919): Treaty between Allies and Bulgaria at end of World War, ceding Bulgarian territory to Rumania, Serbia, and Greece.

**Nystadt** (1721): Peace between Russia and Sweden, involving cession to Russia of territory conquered by Peter the Great along the Gulf of Finland.

**Paris** (1763): Terminated Seven Years' War (French and Indian War in America). France lost all her American possessions to Great Britain.

**Paris** (1783): End of American Revolutionary War.

**Paris** (1856): End of Crimean War.

**Paris** (1898): End of Spanish-American War; Cuba liberated and Porto Rico, Guam, and Phllippines ceded to United States in return for $20,000,000.

**Portsmouth** (1905): Termination of Russo-Japanese War; great increase of power for Japan.

**Pressburg** (1805): Peace between France and Austria, after the latter had been defeated for the third time by Napoleon.

**Pretoria** (1902): Ended Boer War. Transvaal and Orange Free State lost their independence, becoming colonies of Great Britain.

**Rapallo** (1920): Settled controversy between Italy and Jugo-Slavia over Fiume, giving it status of a sovereign city contiguous to Italy.

**Riga** (1921): Russia ceded to Poland 44,000 square miles of territory with 3,685,000 inhabitants.

**Ryswick** (1697): Treaty of peace between France and England, Spain, and Holland.

**St. Germain** (1919): Treaty with Austria at end of World War, breaking up the Dual Monarchy into Austria, Hungary, Czecho-Slovakia, and Jugo-Slavia, and ceding territory to Poland and Rumania.

**Sèvres** (1920): Treaty of peace with Turkey at end of World War, depriving it of over half its population and two-thirds of its territory.

**Shimonoseki** (1895): Treaty of peace ending Chino-Japanese War of 1894.

**Tilsit** (1807): Treaty of peace and alliance between Napoleon and the czar of Russia.

**Trianon** (1920): Treaty of Allies with Hungary at close of the World War; established boundaries with cessions to border states.

**Triple Alliance** (1882): A defensive alliance created when Italy joined the Dual Alliance of Germany and Austria, formed in 1879.

**Triple Entente** (1907): Diplomatic union of Great Britain, France, and Russia to counterbalance the Triple Alliance, concluded when agreement between England and Russia (1907) and England and France (1904) was added to the Dual Alliance of France and Russia (1891).

**Troyes** (1420): Treaty interrupting Hundred Years' War between England and France. Henry V of England to marry Katherine of France and succeed to French throne on death of Charles VI.

**Utrecht** (1713): Peace treaty after the defeat of the French in the War of the Spanish Succession, giving Spain, Naples, and Sicily, and the Spanish colonies to the French claimant but with numerous territorial concessions to Austria, England, and Holland.

**Verdun, Partition of** (843): Treaty among the three sons of Louis the Pious dividing Charlemagne's empire into three parts, the western third of which later developed into France and the eastern third into Germany.

**Versailles** (1919): Treaty of peace with Germany following the World War, Germany lost territory in Europe amounting to almost 48,000 square miles, and more than 1,000,000 square miles of colonial possessions; reparations of many billion dollars to be paid.

**Vienna, Treaties of** (1815): Division of Europe following overthrow of Napoleon. Russia annexed a large part of Poland, and northern Italy was given to Austria; Austrian Netherlands were given to Holland, and part of Saxony to Prussia.

**Washington** (1871): Between Great Britain and United States, referring the *Alabama* claims and the northwest boundary dispute to arbitration.

**Washington** (1922): A series of treatics signed at the conference of nine great powers at Washington, 1921–22; the most important were (a) Five-Power Naval Treaty, providing for a reduction in naval armament; (b) Five-Power Treaty restricting the use of submarines and prohibiting use of poison gas; (c) Four-Power Treaty, between United States, Great Britain, France, Japan, providing for maintenance of existing conditions in Paeific; (d) Nine-Power Treaty relating to China.

**Webster-Ashburton** (1842): Between Great Britain and United States, settling the northeast boundary dispute.

**Westphalia** (1648): Ended Thirty Years' War.

**Trinity College.** At Hartford, Conn.; men; non-sectarian, but has Episc. affiliations; founded 1823; arts and science, civil engineering.
**Trinity College.** At Durham, N.C.; co-ed., Meth. Episc.; founded 1838 (full college course 1852); arts and science.
**Trinity College,** Oxford, **2610.**
**Trinity College.** At Washington, D.C.; for women; founded 1897 (opened 1900); Rom. Cath.; arts and science.
**Trinity River,** Tex., flows 550 mi. s.w., entering Galveston Bay 40 mi. n. of Galveston; *map,* **3478;** dam at Fort Worth, **1333;** La Salle murdered, **1964.**
**Trinity University.** At Waxahachie, Tex.; Presb., co-ed.; founded 1869.
**Trio** (*trē'ō*), in music, **2584.**
**Triomphe, Aro de** (*ärk dē trē-ôńf'*), Paris, **2682,** *pictures,* **2681, 2683.**
**Triple Alliance,** formed 1883 between Germany, Austria-Hungary, and Italy, **1196, 3529;** and World War, **3795.**
**Triple Entente** (*äṅ-täńt'*), agreement between France, Russia, and England completed in 1907, **1089, 1196, 3529.**
**Trip'oli** or **Libya,** Ital. colony in N. Africa; 406,000 sq. mi.; estimated pop. between 1,000,000 and 6,000,000; **3541–2,** *maps,* **40–1;** includes Fezzan, **3105;** U.S. war with pirates, **971, 1883, 1973.**
**Tripoli,** port on n. coast of Africa, cap. of Tripoli; pop. 75,000; caravan trade center; **3542.**
**Tripoli, Tripolis,** or **Tarabulus** (*tä-rä'bụ-lụs*), Syria. Anc town near coast, 45 mi. n.e. of Beirut; pop. 30,000; captured 1109 by Crusaders after siege of 5 years.
**Tripolitza** (*trē-pō-lēt'sä*) or **Tripolis,** Greece. Town 22 mi. s.w. of Argos; pop. 11,000; cap. of Morea under Turks; taken 1821 by Gk. insurgents; destroyed 1825 by Ibrahim Pasha.
**Trireme** (*trī'rēm*), anc. galley, **3207.**
**Tristan da Cunha** (*trĭs-tän' dä kụn'-yä*), mountainous islet in s. Atlantic, about midway between Buenos Aires and Cape of Good Hope; claimed by Gt. Brit.; **254.**
**Tristan** (*trĭs'tăn*) or **Tristram of Lyonesse,** hero of Celtic legend, sent to bring Iseult (Isolde), bride of his uncle, king of Cornwall, drinks by mistake of a love potion which makes him Iseult's lover; ivy legend, **1854;** opera by Wagner, **3663.**
**Triton** (*trī'tŏn*), in Gk. myth., son of Poseidon and Amphitrite, personification of roaring waters; blows a twisted seashell to calm or raise the waves; numerous tritons sometimes appear, with the torso of a man, the tail of a dolphin, and the forefeet of a horse; **2891.**
**Triton,** a gastropod mollusk; trumpet-shaped shell, *picture,* **3203.**
**Trium'virate,** in Rom. history; first, **2878, 564;** second, **258.**
**Trochee** (*trō'kē*), metrical foot, **2851.**
**Trochilidae** (*trō-kĭl'ĭ-dē*), the humming-bird family, **1698.**
**Troels-Lund, Troels Frederik** (1840–1921). Danish historian; Nobel prize winner 1915; brilliant stylist; chief work a Scandinavian history in 14 volumes.
**Troezen** (*trē'zĕn*). Anc. city of Peloponnesus, Greece; prominent in Persian wars, later ally of Sparta.
**Troglodytidae** (*trŏg-lō-dĭt'ĭ-dē*), the wren family of birds, **3815,** *picture,* **419.**
**Trogon** (*trō'gŏn*). A family of beautiful tropical forest birds, noted for their gorgeous plumage; 8 genera occur in S. and Cent. Amer.; the coppery-tailed trogon (*Trogon ambiguus*), 12 in. long, the male bronze-green and red and the female brown and pale geranium red, occurs in s. Ariz. and s. Texas and is the only trogon found n. of Mexico. *See also in Index* **Quetzel.**
**Troilus** (*trō'ĭ-lŭs*). In Gk. legend, son of Priam, king of Troy; in medieval legend, hero of the love story which forms basis of Shakespeare's tragedy 'Troilus and Cressida' and Chaucer's poem of same name.
**Tro'jan War, 3542–4;** Achilles, **8, 9;** Ajax, **69;** Amazons, **106;** Aphrodite, **155;** Athena aids Greeks, **248;** Hector, **1626–7;** legends collected in Homeric poems, **1675–6;** Odysseus, **2562;** Paris, **2680;** Poseidon aids Greeks, **2891.** *See also in Index* **Homer (stories from); Troy.**
**Trolley-wires, 3371.**
**Trollhättan Falls,** Sweden, of Göta R., **3404, 3403.**
**Trollope** (*trŏl'lŭp*), **Anthony** (1815–82). Eng. novelist, keen-sighted chronicler of Eng. middle-class life ('Barchester Towers'; 'Doctor Thorne'; 'Framley Parsonage').
**Trolls** (*trōlz*), in Norse myth., the "hill people," underground elves, **1219.**
**Trom'bone,** a musical instrument, **1680, 1681, 2591,** *picture,* **2382.**
**Tromp, Martin Harpertzoon** (1597–1653), Dutch admiral; defeated Span. and Port. fleets 1639; commander in several engagements with Eng. fleet 1652–3; **2427, 435,** *picture,* **1153.**
**Tromsö** (*trōm'sû*), Norway, **2534.**
**Trondhjem** (*trŏn'yĕm*) or **Throndhjem,** Norway, seaport on w. coast on Trondhjem Fiord; pop. 55,000; trade in timber, fish, copper, iron; **2532,** *picture,* **2535.**
**Troo,** a Fr. village, **666.**
**Trope** (*trōp*) or **figure of speech, 1238–9;** slang, **3248.**
**Trop'ics** or **torrid zone,** region of greatest heat, bordering the equator, **1968–9, 3862;** heavy rainfall, **2972–3, 3366;** winds feeble or lacking, **3750.** *See in Index* **Cancer, Tropic of; Capricorn, Tropic of.**
**Troppau** (*trŏp'ou*) or **Opava,** Czecho-Slovakia. Former cap. of Austrian Silesia, on Oppa R., 80 mi. n.e. of Brunn; pop. 32,000; makes cloth, beet sugar, machinery.
**Tros,** in Gk. myth., king of Troy, **1393.**
**Trotting horse,** speed records, **1685.**
**Trotwood, Betsey.** In Dickens' 'David Copperfield', David's eccentric but good-hearted great-aunt.
**Trot'zky, Leon** (born 1879), Rus. revolutionary leader, **3544–5;** and Lenin, **1986.**
**Troubadours** (*trụ'bȧ-dụrs*), Fr. minstrels, **3039, 2378.**
**Trousers, 900, 901.**
**Trout,** a food fish, **3545, 1275, 1279,** *picture,* **1272;** included in salmon family, **3114.**
**Trout lily** or **dogtooth violet, 1025, 3645.**
**Trouvères** (*trụ-vêr'*), minstrels of n. France, **3039.**
**'Trovatore** (*trō-vä-tō'rā*), **Il',** opera, **3628, 2584.**
**Trowbridge, John Townsend** (1827–1916). Amer. writer of boys' stories, b. near Ogden, N.Y. ('Cudjo's Cave'; 'Jack Hazard Series'; 'The Prize Cup').
**Troy** or **Il'ium,** anc. city in n.w. Asia Minor famous in Gk. legend; scene of Trojan War; *map,* **27;** center of Aegean civilization, **29;** excavation, **3137, 3138, 3543.** *See also in Index* **Homer (stories from); Trojan War.**
**Troy,** N.Y., "collar capital" of U.S.; pop. 72,013; **3545, 1969;** Erie Canal, **627, 1692.**
**Troyes** (*trwä*), France, town on Seine R., 90 mi. s.e. of Paris; pop. 56,000; makes hosiery; medieval fair, **1219;** Treaty of (1420), **1700.**
**Troyon** (*trwä-yôń'*), **Constant** (1810–65), Fr. painter, by many critics considered the foremost animal painter of modern times; his rich and glowing landscapes include animals as an integral part; **2632.**
**Troy weight, 3715;** origin, **1219.**
**Truce, 213.**
**Truce of God.** In feudal times, prohibition by church of private war on holy days and seasons, and certain week-days.
**Truck'ee River,** small stream in California and Nevada connecting L. Tahoe with Pyramid L.; *map,* **2445.**
**Truckee-Carson irrigation project, 2444,** *picture,* **1829.**
**Trudgen stroke, 3410.**
**Truf'fle,** a fungus, **2375.**
**Trumbull, John** (1750–1831), Amer. judge and political satirist, **112.**
**Trumbull, John** (1756–1843), Amer. historical and portrait painter ('Bunker Hill'; 'The Death of Montgomery'), **2634.**
**Trumbull, Jonathan** (1710–85), Amer. colonial statesman, gov. of Connecticut, **869, 2507.**
**Trumpet,** a musical instrument, **1680, 1681, 2591,** *picture,* **2382.**
**Trumpeter swan, 3400.**
**Trumpet narcissus, 2397.**
**Trumpet shell, 3201,** *picture,* **3203.**
**Trumpet-vine, 3545.**
**Trunk,** of elephant, **1126.**
**Tru'ro,** Nova Scotia. Farming and dairying center on Salmon R., 2 mi. from head of Cobequid Bay, on Bay of Fundy; pop. 8000; knitted goods, condensed milk; Nova Scotia normal and agricultural colleges.
**Trust company,** banking, **3546, 328.**
**Trustee,** in bankruptcy, **326.**
**Trusts, business, 3545–6;** corporations, **893–4;** Standard Oil Co., **3034, 3545.**
**Trusts, legal, 3546.**
**Trusts, municipal,** in Glasgow, **1470.**
**"Truth forever on the scaffold," 116.**
**Try'on, Dwight William** (born 1849), Amer. landscape painter, **2634.**
**Trypanosomes** (*trĭp'ȧ-nō-sūms*), various single-celled parasitic animals, **3944;** sleeping sickness germ, *picture,* **1450.**
**Tryp'sin,** a proteid-digesting enzyme, **1010.**
**Tsaritsyn** (*tsä-rē'tsĭn*), Russia. Port on lower Volga R.; pop. 100,000; r.r. junction; important transit trade and mfrs.
**Tschaikovsky** (*chī-kŏf'skē*), **Peter Ilyitch** (1840–93), Rus. composer, **3546;** chief works, **2381.**
**Tsetse** (*tsēt'sē*) **fly,** carrier of sleeping sickness, **3546–7;** and buffaloes, **131;** in Congo, **34;** in E. Africa, **1068.**
**Tsien-tang,** r. of China in province of Chekiang; enters Bay of Hangchow; **1574.**
**Ts'in** (*chĭn*), anc. Chinese dynasty; most important ruler Shi Hwang-ti, "first universal emperor"; **745.**
**Tsinan** (*tsĭ-năn'*)or **Tsinanfu,** China, cap. of Shantung, 3 mi. from Yellow R.; pop. 250,000; silk, precious stones, glass; univ.; on Tsinan-Tsingtau r.r.; **3195.**
**Tsingtau** (*tsĭng-tou'*) or **Tsingtao,** China, treaty port in Shangtung on Bay of Kiaochow; pop. 75,000; **3195,** *picture,* **3196.**
**Tsushima** (*tsụ'shē-mä*). Isl. of Japan in Korean Strait; battle of Sea of Japan fought off its coast (1905).
**Tsze-Hsi** (*tsē'shē*) (1835?–1908). The "Great Empress Dowager" of China and its virtual ruler for half a century; the most famous woman in Chinese history; encouraged Boxer rising; last prominent reactionary of old era.
**Tuamotu** (*tụ-ä-mō'tụ*) or **Low Archipelago,** group of 80 atolls in Pacific s. of Marquesas; 366 sq. mi.; pop. 4000; **2621, 2623, 2624,** *map,* **2624–5.**
**Tuaregs** (*twä'rĕgs*), nomadic tribe of cent. and w. Sahara, **33, 37, 3106;** control Fezzan, **3542.**

**Tuat** (*tụ-ät'*), group of oases in w. part of Algerian Sahara, n. Africa, **3104.**

**Tuatera** (*tụ-ä-tā'rä*), a reptile, **2038, 2997.**

**Tu'ba** or **bass horn,** a musical instrument, **1680, 1681,** *picture,* **2382.**

**Tube.** *See in Index* **Subway.**

**Tuberculo'sis,** a bacterial disease, **1450;** bacillus, **2227,** *picture,* **1452;** X-ray diagnosis, **3825–6;** fight against, **1615.**

**Tuberose,** a flower, **3547.**

**Tu'bers, 532;** potato, **2900–2;** sweet potato, **3405.**

**Tubes, pneumatic, 2846–7, 2893,** *picture,* **2897.**

**Tubiflorales,** an order of flowers with tubular corollas, **3943.**

**Tubina'res,** tube-nosed order of seabirds, **412;** includes albatross, **80;** petrel, **2747.**

**Tübingen** (*tü'bĭng-ĕn*), Germany, town in Württemberg on Neckar R. 22 mi. s. of Stuttgart; pop. 21,000; univ., **832.**

**Tubuai** (*tụ-bụ-ī'*) or **Austral Islands,** in s. Pacific; 110 sq. mi.; pop. 2000; **2621, 2624,** *map,* **2624–5.**

**Tuck, Friar,** vagabond friar in Robin Hood legends; appears in 'Ivanhoe' as the "holy clerk of Copmanhurst"; **3029.**

**Tucson** (*tū-sŏn'* or *tŭk'sŏn*), Ariz., 69 mi. n. of Mex. border; pop. 20,292; farming, cattle-raising, and mining dist.; copper mines, r.r. shops; state univ.; founded, **202.**

**Tucuman** (*tụ-kụ-măn'*) or **San Miguel de Tecuman,** Argentina. Cap. of province of Tucuman, in n.; pop. 92,000; commercial and r.r. center; univ.; declaration of independence from Spain signed by Plata provinces 1816.

**Tu'dor, House of,** Eng. royal family, **3547;** Henry VII founds, **1635;** list of rulers, **1152.**

**Tudor style,** in architecture, exemplified by Hampton Court, *picture,* **1154.**

**Tuesday,** 3d day of week, **969.**

**Tu'fa,** a cellular limestone, **2010.**

**Tufts College.** At Medford, Mass.; co-ed.; chartered 1852 (opened 1854); established by Universalists but now non-sect.; liberal arts, engineering, theology, graduate work; medical and dental schools in Boston.

**Tugela** (*tụ-gā'lä*), r. of Natal, S. Africa; length 300 mi.; *picture,* **3281.**

**Tuileries** (*twēl-rē'*), royal palace in Paris, **1368, 2685.**

**Tula** (*tụ'lä*). Cap. of govt. of Tula in cent. Russia, 110 mi. s. of Moscow; pop. 140,000; formerly famous for mfr. of firearms, samovars.

**Tulane University of Louisiana,** at New Orleans, La.; co-ed., non-sect.; founded 1834; arts and science, engineering, law, medicine, dentistry, pharmacy, commerce and business administration, education, music, graduate work; *picture,* **2069.**

**Tu'lip,** a flower of the lily family, **3547;** bulb structure, **532;** in Holland, **2440, 2441.**

**Tulip tree,** a tree with tulip-shaped flowers, **3547–8;** classified, **3533;** confused with poplars, **2880;** winged seed, **3172.**

**Tull, Jethro** (1674–1741), Eng. farmer and writer, **48.**

**Tulle** (*tül*). Picturesque town in s. France, 106 mi. s.w. of Clermont-Ferrand; pop. 17,000; fine 15th-cent. cathedral; from Tulle first came fabric of that name.

**Tullius, Servius.** *See in Index* **Servius.**

**Tul'liver, Maggie,** heroine of George Eliot's 'Mill on the Floss'; her spiritual struggles are largely autobiographical; **2540.**

**Tul'lus Hostil'ius,** Rom. king, **3041.**

**Tul'sa,** Okla., r.r. and mfg. city in n.e. on Arkansas R.; pop. 72,075; heart of Mid-Continent Oil Field; more than 300 oil and refining companies; natural gas and coal for manufacturing; farming and stock-raising center; **2576.**

**Tumble-bug,** a beetle, **369,** *picture,* **367.**

**Tumbler lock, 2042.**

**Tumbler pigeon, 2804,** *picture,* **2805.**

**Tumble-weed** or **Russian thistle, 3712, 3172, 3490.** Name is also given to several species of tumbling pigweeds.

**Tu'na fish.** Same as **Tunny.**

**Tunbridge Wells,** England. Inland watering-place on border of Kent and Sussex, 30 mi. s.e. of London; pop. 35,000; medicinal springs; large trade in Tunbridge ware.

**Tun'dras,** arctic plains, **2790;** in Alaska, **76;** Asia, **226, 3227, 3228;** Canada, **2515–6, 603;** Europe, **1191, 3086,** *picture,* **3085.**

**Tung oil,** or China wood-oil, **1227, 2643.**

**Tung'sten,** a heavy metallic element, **3548, 4042;** in Alaska, **74;** in alloys, **99, 3548;** in Bolivia, **450;** Colorado, **841;** as electric light filament, **1123–4;** in Siam, **3227.**

**Tungsten steel, 3548.**

**Tunguses** (*tụn-gụ'sĕz*), Ural-Altaic people of Siberia and Mongolia, including the Tunguses proper and the Manchus, **2285.**

**Tu'nic,** Gk. garment, **897.**

**Tu'nicates,** sub-phylum of animals resembling primitive vertebrates, **3947;** evolutionary position, *diagram,* **128.**

**Tuning,** in radio telegraphy, **3762.**

**Tuning fork,** a steel fork giving a definite pitch when struck, *picture,* **2382.**

**Tu'nis** or **Tunisia,** a Fr. protectorate in N. Africa, e. of Algeria; 50,000 sq. mi.; pop. 2,000,000; **3549–50,** *maps,* **40–1, 97;** Carthage, **650–1;** crusade of Louis IX, **2065;** piracy, **971.**

**Tunis,** cap. of Fr. protectorate of Tunis; pop. 275,000; **3550,** *pictures,* **3549;** Decatur's exploit, **971.**

**Tunkers.** Same as **Dunkards.**

**Tunnels, 3550–2;** in mining, **2250;** pneumatic appliances used in construction, **2847, 3551, 3552;** in water works, **3701;** world's most famous, **3552.** *See also in Index* **Aqueducts; Subway.**

**Tun'ny** or **tuna,** a large mackerel-like fish, **3552–3, 1276, 1518;** in Mediterranean, **2194, 3230.**

**Tuolumne** (*twŏl'ŭm-nē*), r. in California flowing from Yosemite National Park 200 mi. to San Joaquin R., **3832.**

**Tu'pelo** or **black gum,** a tree with tufted leaves at the branch ends, common in s. U.S.; classified, **3533.**

**Tu'piks,** Eskimo tents, **1177.**

**Tupper, Sir Charles** (1821–1915), Canadian statesman, **3553.**

**Tupper, Martin Farquhar** (1810–89). Eng. author ('Proverbial Philosophy', commonplace moralizing blank verse).

**Turaco,** a medium-sized fruit-eating bird; feathers, **411.**

**Turban shell, 3202.**

**Tur'bine, 3553–4;** a form of rotary engine, **3349;** at Niagara Falls, *picture,* **3695;** in steamships, **3214.**

**'Turbinia',** ocean liner, **3214.**

**Tur'bit,** breed of domestic pigeons, **2804.**

**Tur'bot,** a large flatfish, **1279;** eggs, **1090.**

**Tur'didae,** the thrush family, **3494, 412;** bluebirds, **439;** robins, **3028;** speckled breasts, **412**

**Turenne** (*tü-rĕn'*). **Henri de la Tour d'Auvergne, Vicomte de** (1611–75). Marshal of France, one of great captains of history, whose campaigns Napoleon advised soldiers to "read and re-read"; commanded Fr. armies in many of wars of Louis XIV.

**Turgenief** (*tụr-gĕn'yĕf*), **Ivan** (1818–83), Rus. novelist, **3554–5, 2541.**

**Turgot** (*tụr-gō'*), **Anne Robert Jacques, Baron de Laune** (1727–81), Fr. statesman and economist, comptroller-general of France 1774–76; attempted to establish complete freedom of trade and abolish feudal privilege; **2066, 1367, 2148.**

**Turin** (*tū-rĭn'*) (Ital. *Torino*), 4th largest city in Italy; pop. 452,000; center of automobile industry; **3555, 1843, 1844.**

**Turkestan',** region in Asia between the Caspian Sea on the w. and Desert of Gobi on the e., **3555–6, 228,** *map,* **232–3;** camels, **591;** conquered by Mongols, **2285;** Great Pamir, **226;** rugs, **3079;** Tatars, **3440.**

**Turkey,** a fowl, **3556, 2908;** Australian brush turkey, **1090.**

**Turkey-buzzard, 550–1,** *pictures,* **415, 410.**

**Turkish delight,** a confection, **630.**

**Turkish Empire,** country of Asia Minor; 175,000 sq. mi.; pop. 8,000,000; **3557–61,** *maps,* **232–3, 1196–7;** Bosporus, **468;** cap. Constantinople, **871–2;** Dardanelles, **963;** elevation, *map,* **232–3;** government, **3560;** population, **3558–9,** *map,* **232–3;** rainfall, *map,* **232–3;** religion, **3560, 2276, 2278;** rug-making, **3077–9;** surface features, **3557–8, 234;** vegetation, *map,* **232–3.** —*History:* **3557, 3559–60, 1661;** rise of power, **3559, 3177, 79, 1703;** Byzantine Empire overthrown (1453), **552;** conquests extended, **38, 166, 918, 1107, 3011, 3426;** Greece gains freedom, **1526;** Crimean War, **922, 310, 2505–6;** Serbian revolts, **3177, 377;** Rumania independent, **523;** war with Russia (1877–78), **3560, 310, 468, 3177;** Young Turk rev., **3560, 310;** war with Italy, **3541;** Balkan War (1913), **310;** Armenian massacre, **213;** World War, **3795, 3798, 3806–7, 166, 2643;** Treaty of Sèvres and after, **3557, 1662, 963, 3812, 1526.**

**Turkish language,** classified, **1702.**

**Turkish rugs, 3077–9.**

**Turks,** people, **3557, 3558;** in Balkans, **307, 468, 2097;** crusades against, **929–32, 3112;** in Russia and Siberia, **3440, 3229;** in Turkestan, **3556.**

**Turk's cap lily, 2009.**

**Turk's cap shell, 3202,** *picture.* **3203.**

**Turlen,** Finland. *See in Index* **Abo.**

**Tur'meric,** a plant yielding spice and yellow dye, **1460, 3317, 3318.**

**Turner, Charles Yardley** (1850–1918), Amer. mural painter, **3833, 322.**

**Turner, Joseph Mallord William** (1775–1851), Eng. landscape painter, **3561, 2631, 1170;** 'The Fighting Téméraire', **1246.**

**Turnip,** cabbage-like vegetable with edible root, **554, 555;** contains vitamins, **3652;** sulphur compounds cause odor, **3389;** when and how to plant, **1397.**

**Turnpike** or **toll-road, 3024.**

**Tur'pentine,** pine sap or oil distilled from it, **3561–2;** in paints, **2642;** in synthetic camphor, **594;** in varnish, **2643;** yields rosin, **2997.**

**Turquoise** (*tŭr-koiz'*), a precious stone, **1409, 1410;** New Mexico, **2466;** Persia, **2734.**

**Turtle,** an armored reptile, **3562–8;** eggs, **1090;** evolutionary position, **128;** land types called tortoises, **3520;** as pets, **2758;** story, 'Why the Tortoise Bites So Hard', **3564–8.**

**Turtle dove.** Same as **Mourning dove.**

**Turtle Mts.,** range in North Dakota, **2522,** *map,* **2524.**

**Tuscaloo'sa,** Ala. Industrial city 50 mi. s.w. of Birmingham on Black Warrior R.; pop. 11,996; cotton, corn, lumber, coal, iron, and stock-raising interests; state univ.; state insane asylum.

**Tus'can dialect,** Italy, **1839;** used by Dante, **1832.**
**Tuscan** or **Tyrrhenian Sea, 2194, 1186.**
**Tus'cany,** dist. in w. Italy, corresponding roughly to anc. Etruria; fertile, rich in minerals; chief port Leghorn; **1840,** *map,* **1836;** history, **1293, 1186, 1837, 3638;** language and literature, **1832, 1839, 1294;** volcanoes, **3660.**
**Tuscaro'ras,** Indian tribe of Iroquoian stock originally occupying Neuse R. region of e. North Carolina, **1766.**
**Tus'culum.** Anc. city of Latium 15 mi. s.e. of Rome, near modern Frascati; favorite residence of Cicero and other noted Romans.
**Tusk,** an elongated tooth, **3454;** elephant, *picture,* **1126;** pig-like animals, *pictures,* **1671;** walrus, **3668;** wild boar, **440.**
**Tuskegee** (*tŭs-kē'gē*), Ala., center of cotton region, 40 mi. e. of Montgomery; pop. 2475; Tuskegee Normal and Industrial Institute for negroes, **73, 3674.**
**Tussock moth,** a leaf-eating type. **548;** antenna, *picture,* **547;** parasitic foes, **2680.**
**Tus'sur silk, 3237.**
**Tut'hill, Richard Stanley** (1841–1920), Amer. judge, **1906.**
**Tutt'lingen,** Germany. Town in s. Württemberg; pop. 16,000; victory of Austrians and Bavarians over French 1643 (Thirty Years' War).
**Tutuila** (*tu-tu-ē'lä*), principal isl. of Amer. Samoa; 77 sq. mi.; pop. 6200; chief export copra; **3120.**
**Tuxpan** (*tus'pän*), Mexico, maritime town on Gulf of Mexico 145 mi. n. of Vera Cruz; oil field, **2212.**
**Tver** (*tvĕr*), Russia. Cotton-mfg. and trade center, on Volga R. 100 mi. n.w. of Moscow; pop. 64,000; cap. of independent principality 13th to 15th cents.
**Twachtmann** (*twäĸt'män*), **John Henry** (1853–1902), Amer. landscape painter, called a "minor poet of the brush," **2634.**
**Twain, Mark** (Samuel Langhorne Clemens) (1835–1910), Amer. humorist and novelist, **3569, 115,** *picture,* **3021.**
**Tweed, William Marcy** (1823–78), Amer. politician, leader of famous Tweed Ring, **3432, 2498.**
**Tweed.** River rising in Peeblesshire, s. Scotland, and flowing e. 97 mi. to Berwick; gives name to tweed cloth.
**Twelfth Day** or **Epiphany, 759.**
**Twelfth Night,** end of Christmas celebration, **2479, 759.**
**'Twelfth Night',** play by Shakespeare, **3191;** quotations from, **3192.**
**Twenty-four hour clock, 3501.**
**'Twenty Years After',** novel by Dumas, **1047.**
**Twick'enham,** England. Residential town on Thames s.w. of London; pop. 30,000; residence of Alexander Pope, Horace Walpole, Louis Philippe.
**Twilight, 3570;** limit in atmosphere, *picture,* **51.**
**Twilight sleep, 125.**
**Twine.** *See in Index* **Rope and twine.**
**Twin Falls,** Idaho, agricultural center 110 mi. s.e. of Boise; pop. 8324; sugar mfr.; on Snake R.; power from Shoshone Falls; **1725.**
**Twins,** a constellation. *See in Index* **Gemini.**
**Two Sicilies,** kingdom formed by union of Sicily and Naples (1130) and at times other parts of s. Italy; history, **2391, 3230, 1399.**
**Ty'burn.** Chief place of execution in London prior to 1783; near n.e. corner of Hyde Park; named from small tributary of Thames.
**Tyche** (*tī'kē*) or **Fortuna,** in myth., goddess of fortune, **1333.**
**Tycho Brahe.** *See in Index* **Brahe.**
**Tyler, John,** father of President Tyler, **3570.**
**Tyler, John** (1790–1862), 10th president of U.S., **3570–1;** administration, **3571, 2597;** early life, **3570;** elected vice-president, **1594;** advocates secession, **3571.**
**Tyler, Wat** (d. 1381), leader of Peasants' Revolt in England, **3571–2, 3016.**
**Tyler,** Texas. City 95 mi. s.e. of Dallas; pop. 12,085; ships cotton, corn, berries, vegetables; makes boxes, bricks; oil center.
**Tylor, Sir Edward Burnett** (1832–1917). Eng. anthropologist ('Primitive Culture'; 'Natural History of Religion').
**Tyl'tyl,** in Maeterlinck's 'Blue Bird', **2112–5.**
**Tym'pani** or **kettle-drums, 2591.**
**Tympan'ic membrane,** the ear-drum, **1056.**
**Tyn'dale, William** (1492?–1536), Eng. translator of New Testament and most of Old; burned as heretic; "more than any other man" gave "its characteristic shape to the Eng. Bible"; **389, 1164.**
**Tyndall, John** (1820–93), Eng. physicist, **3572.**
**Tyne** (*tīn*), r. of n. England, rising in Northumberland Hills, flowing e. through coal-mining and mfg. region into North Sea, **2449, 1158,** *map,* **1152–3.**
**Tynemouth** (*tīn'mŭth*), England. Seaport and watering place in Northumberland at mouth of R. Tyne; pop. 60,000; large export trade in coal and coke; fisheries, shipyards.
**Type,** printing, **3572;** beginnings of modern printing, **2916, 456.**
**Type-casting machines, 3572.**
**Type metal, 99;** antimony in, **150, 3572;** bismuth, **428.**
**Typesetting,** linotype, **2019–23;** monotype, **2303–5.**
**Typewriters, 3573;** early type, *picture,* **1798;** Hartford leads world, **1595;** used by blind, **437.**
**Typhoid** (*tī'foid*) **fever,** a bacterial disease, **1450;** carried by flies, **1312, 1313;** controlled by sanitation, **1614–5;** vaccine treatment, **151–2,** *picture,* **3613.**
**Typhoon** (*tī-fon'*), Asiatic name for cyclone, **3366;** in Philippines, **2765.**
**Ty'phus** or **spotted fever, 1452, 1615.**
**Typog'raphy, 456.** *See also in Index* **Books; Printing; Type.**
**Tyr,** Teutonic god of war, **969.**
**Tyran'nidae.** Same as **Flycatcher family.**
**Tyran'nosaur,** a huge prehistoric reptile, **134.**
**Tyr'anny,** form of govt. in Gk. city-states, **1521.**
**Tyre** (*tīr*), famous city of anc. Phoenicia on Mediterranean coast, **2774, 3807.**
**Tyr'ian purple,** dye obtained from shellfish, **2774, 1049;** shellfish, *picture,* **3201.**
**Tyrol** (*tĭr'ōl*), dist. straddling Austro-Italian frontier; famous for scenery; 10,305 sq. mi.; chief city, Innsbruck; **3573–4, 270,** *map,* **271;** Austrian, **269;** Castle Runkelstein, *picture,* **270.**
**Tyrone** (*tī-rōn'*). Inland county in province of Ulster, n. Ireland; 1260 sq. mi.; pop. 143,000.
**Tyr'rell, James William** (born 1863), Canadian civil engineer; participated in exploration and surveying expeditions to Hudson Bay and Canadian northwest; published books of travels; **625.**
**Tyrrhenians** (*tĭ-rē'nĭ-ănz*). Same as **Etruscans.**
**Tyrrhenian** or **Tuscan Sea, 2194, 1186.**
**Tyrtaeus** (*tûr-tē'ŭs*) (7th cent. B.C.). Gk. martial poet; legend says, a lame schoolmaster derisively sent by Athenians to Sparta in response to request for a general in 2d Messenian War; his warlike songs, however, inspired them to victory.
**Tyumen** or **Tiumen** (*tiu-mĕn'*), Siberia. Commercial center 120 mi. s.w. of Tobolsk on Tura R.; pop. 34,000; at junction of several great routes.
**Tze-Hsi.** Same as **Tsze-Hsi.**
**Tziganes** (*tsiğ'ä-nĭz*), gipsies of Hungary, **1702.**

# U

YOU have learned that C and G, like I and J, were originally only variations of the same letter, but would you guess that the letters U, V, W, Y were all descended, like F, from the Phœnician *Wau* or *Vau*, which had once been the horned asp of Egypt? (See the story of F). In Latin for a long time the forms V and U were used without distinction. But in the course of time the form V came to be used by preference at the beginning of a word and the form U elsewhere. As the consonant sound more commonly occurred at the beginning, the form V finally came to denote the consonant and the form U to represent the vowel.

**Ubangi** (*ụ-băn'gē*) or **Mobangi River,** chief n. tributary of Congo, formed by junction of Mbomu and Welle; flows s.w. and w. 700 mi. forming boundary between Fr. Equatorial Africa and Belgian Congo; *map,* **40–1.**

**Uberti** (*ụ-bĕr'tē*), Florentine family, **1293.**

**U-boat,** Ger. name for submarine, **3376.**

**Ucayali** (*ụ-kä-yä'lē*) **River,** S. Amer., one of main headstreams of Amazon, rising in cent. Peru; flows n. 1000 mi. to join Marañon; *maps,* **3288–9, 2744.**

**Uccello** (*ụt-chĕl'lō*), **Paolo** (1397–1475), Ital. painter, **2629.**

**Udaipur** (*ụ-dī-pụr'*) or **Mewar,** native state of India in Rajputana agency; 12,756 sq. mi.; pop. 1,400,000; palaces on L. Pichola, *picture,* **1755.**

**Udal** (*yụ'dȧl*), **Nicholas** (1504?–56). Eng. schoolmaster, author of earliest extant Eng. comedy, 'Ralph Roister Doister'.

**Udine** (*ụ'dē-nā*). Cap. of Udine province, n. Italy, 83 mi. n.e. of Venice; pop. 50,000; makes silk, velvet; trade in flax and hemp; Ital. military base 1915–18; occupied by Austrians 1917.

**Uffizi** (*ụ-fēt'sē*) **Palace,** Florence, Italy (erected 1560–76); art gallery, **1293, 1849–50.**

**Uganda** (*ụ-gän'dä*) **Protectorate,** Brit. protectorate in E. Africa n. of Victoria Nyanza; 110,300 sq. mi.; pop. 3,300,000; chief product, cotton; cap., Entebbe; **1068–9,** *maps,* **1069, 40–1;** Albert Nyanza, **36, 1068;** railway, **3641, 41, 1068, 2025;** Victoria Nyanza, **3641.**

**Uhland** (*ụ'länt*), **Johann Ludwig** (1787–1862). Ger. romantic lyric poet, literary historian, and philologist, wrote many ballads in the spirit of old folk-songs.

**Uinta** (*yụ-ĭn'tȧ*) **Mts.,** range of n.e. Utah, **3609, 3580,** *map,* **3610.**

**Uist** (*wĭst*), **North** and **South,** isls. of Hebrides, **1625.**

**Uitlanders** (*oit'länd-ẽrz*), Boer name for foreign immigrants in S. Africa, **3281–2, 447, 3526.**

**Ujiji** (*ụ-jē'jē*) or **Kavele,** town in Tanganyika Territory, E. Africa; pop. 8000; **3433, 1069;** Stanley finds Livingstone, **3339;** in World War, **1068.**

**Ujjain** (*ụ-jĭn'*), India. Historic town of Gwalior on Sipra R.; pop. 40,000; opium trade; one of 7 sacred cities of Hindus; marks first meridian of longitude in Hindu geography.

**Ukraine** (*yụ'krān*), soviet republic in s.w. Russia; 197,000 sq. mi.; pop. 30,000,000; **3575, 3086,** *map,* **1196–7;** cap. Kief, **1922;** Cossacks, **896;** language, **3096;** Odessa, **2560;** people, **3250.**

**Ukulele** (*yụ-kĕ-lā'lĕ*), musical instrument, **3575.**

**Ulfilas** (*ŭl'fi-lăs*) "Little Wolf" (311?–383?), apostle to the Goths, **1491, 1436;** Bible of, **390.**

**Ulianof, Vladimir Ilyich,** real name of Lenin, **1986.**

**Ulm,** fortress city of Württemberg, Germany, and river port on Danube 43 mi. w. of Augsburg; pop. 60,000; beautiful Gothic cathedral; varied mfrs.; Austrians under Mack surrendered to Napoleon (1805); early playing card manufacture, **643.**

**Ul'mus,** the elm genus, **1139.**

**Ul'nar nerve.** Nerve from brachial plexus in neck to various muscles of forearm and fingers.

**Ulster,** province in n. Ireland; 8330 sq. mi.; pop. 1,582,000; **1807, 1810, 1811;** cap. Belfast, **371.**

**Ul'tima Thu'le,** Rom. name for Shetland Isls., **3206.**

**Ultrami'croscope, 2229–30.**

**Ultra-violet rays, 3312, 1998.**

**Ulysses** (*yụ-lĭs'ēz*). Latin name for **Odysseus.**

**Umbal'la,** India. Same as **Ambala.**

**Umbellif'erae** or **Apiaceae,** the parsley family of plants, **3942;** have flowers radiating in umbrella-shaped clusters.

**Um'bra,** of eclipse, *diagram,* **1074.**

**Um'bria,** dist. in cent. Italy, until 1860 part of Papal States, **1840–1;** school of painters, **2629.**

**U'me** or **Umea River,** Sweden. Rises in n. in mts. on the Norway border, flows s.e. more than 200 mi. forming several lakes, and enters the Gulf of Bothnia.

**Um'pire,** in baseball, **340;** football, **1326.**

**U'naka Mts.** Same as **Great Smoky Mts.**

**Unalas'ka,** Alaska, village and port on isl. of Unalaska, one of Aleutian Isls.; *picture,* **78.**

**Unau',** the two-toed sloth, **3252.**

**Un'cas,** young Indian chief, hero of Cooper's novel, 'The Last of the Mohicans', **878.**

**"Uncle Sam,"** nickname for U.S., **2507.**

**'Uncle Tom's Cabin',** novel by Harriet Beecher Stowe, **3368.**

**Undamped waves,** in radio, **3762.**

**Underground railroad,** in U.S. history, **3249.**

**Undershot waterwheel, 3695.**

**Underwood, Oscar Wilder** (born 1862). Amer. statesman, b. Louisville, Ky., representative and senator from Alabama since 1896; chiefly responsible for Underwood-Simmons Tariff Act of 1913; chosen Democratic leader in the Senate 1920.

**Underwood - Simmons tariff, 3437, 3746.**

**Undine** (*ŭn-dēn'*). In Fouqué's romance of that name, water nymph who wins a soul by marrying a mortal.

**Unearned increment, 3441.**

**Ungava** (*ŭn-gā'vȧ*), former district of Canada, including all of Labrador peninsula except coastal strip; 355,000 sq. mi.; annexed to Quebec, **2945, 1948.**

**Ungava Peninsula,** the northernmost projection of Quebec province, *map,* **602–3.**

**Unguicula'ta,** the group of clawed mammals, **3950.**

**Ungula'ta,** the group of hoofed mammals, **2132, 3951;** evolutionary position, *diagram,* **128;** divided into odd-toed and even-toed, **3434.**

**U'niates,** Eastern Christians who follow rites of Greek Catholic church but acknowledge supremacy of pope; in Poland, **2857.**

**Unicel'lular organisms, 672;** animal types, **2927, 118–9;** plant types, **92, 90, 302–3.**

**U'nicorn.** Fabulous beast, usually having head and body of a horse, hind legs of an antelope, tail of a lion, and a long, sharp twisted horn in the middle of its forehead.

**Unicorn** or **monoceros,** a constellation, *charts,* **873, 3343.**

**Uniformita'rianism.** Modern geologic teaching that existing land forms were created gradually by processes the same as those still at work; opposed to former view that mountains, etc., were due to catastrophic disturbances; view propounded by Hutton; established in science by Lyell, **964.**

**Uniforms, 3575–9;** Army (U.S.), **3575, 3578,** *pictures,* **3576;** Boy Scout, **485;** Brit. Life Guard. *picture,* **2050;** Navy (U.S.), **3578, 2426,** *pictures,* **3577;** West Point cadets, **2236.**

**Unimak** (*ụ-ni-mäk'*) **Island,** Alaska, largest of the Aleutians, **76.**

**Union,** N.J. Town 5 mi. w. of Elizabeth; pop. 20,651; extensive embroidery mfg. and other industries.

**Union, Acts of.** *See in Index* **Act of Union.**

**Union College.** At College View, Nebraska; co-ed., Seventh Day Adventist; founded 1891; liberal arts, agriculture, education, expression, art, music.

**Union College,** at Schenectady, N.Y.; men, non-sect.; arts and science, engineering, graduate work; part of Union Univ., which includes Albany Medical College, Albany Law School, etc.; college fraternity system originated here in 1825; **3136.**

**Union Islands.** Same as **Tokelau.**

**Union Jack,** flag of Gt. Brit., **1510, 1287.**

**Union of South Africa.** *See in Index* **South Africa, Union of.**

**Union of Utrecht, 3612, 2442.**

**Union Pacific Railroad,** first transcontinental r.r. in U.S., **2963, 2432, 3822.**

**Unions, trade, 1947.** *See also in Index* **Labor organizations.**

**Uniontown,** Pa. City 40 mi. s.e. of Pittsburgh in coal and iron region; pop. 15,692; coke, glass, silk, radiators, foundry products.

**Unita'rianism.** A system of Christian belief that rejects the doctrine of the Trinity, fixed creeds, and all authority in religion; first appeared as organized movement in England in 1773; widely influential in New England from middle of 18th cent.; membership in U.S. about 85,000.

**United Brethren.** *See in Index* **Moravians.**

**United Brethren in Christ.** Evangelical Christian sect founded in U.S. under leadership of Philip William Otterbein (1726–1813) and Martin Boehm (1725–1812); membership about 368,000.

**United Confederate Veterans,** 2695.

**United Empire Loyalists,** 617; in New Brunswick, 2449, 3107; in Nova Scotia, 2538; in Ontario, 2583, 3517, 1926.

**United Kingdom of Great Britain and Ireland,** 1510. *See also in Index* **England; Ireland; Scotland; Wales.**

**United Mine Workers of America,** coöperative stores of, 879.

**United Press,** 2475.

**United Provinces,** 2442. *See also in Index* **Netherlands.**

**United Provinces of Agra and Oudh,** a province in n.w. India; 107,000 sq. mi.; pop. 45,500,000; 1745.

**United Spanish War Veterans,** 2695.

**United States, Bank of the.** *See in Index* **Bank of the United States.**

**United States of America,** a republic of N. Amer.; 3,026,789 sq. mi.; pop. (continental U.S.) 105,708,711; 3579–92, *maps,* 3584–5, 2514–5, (relief) 3876, *Study Outline,* 3877–88; animals, 3874–5; arbitration treaties, 172; architecture, 189, 528–31, 2489; athletic organizations, 252; cap. Washington, D.C., 3680–6; census, 676–8; conservation of natural resources, 869–70, 3060, 3062; coöperative societies, 879; fire loss, 1260; flags, 1287–8; fossils, 1336; holidays, 1673, 173, 2196, 2479, 3482; illiteracy, 2881; Indians, 1765–74; labor organizations, 1947; lands, public, 1959–60; lighthouses, 2003–6; literature, *see in Index* **American literature;** national flower, 1483; national parks, 2399–2403; national songs, 2404–5; newspapers, 2472–5; painting, 2634; prohibition, 2920–1; religious denominations, comparative strength of, *graph,* 3583; sculpture, 3164; social settlements, 3269, 16–18; territories and possessions, 3888; water-power resources, 3694, 3584, *picture,* 3697; weights and measures, 3714, 3715.

*Agriculture,* 43–48, 3586, 3588, *graph,* 3591; corn, 888–91; cotton, 901–6; dairying, 949–53; Dept. of Agriculture, 3597, 3600; dry farming, 3588, 641; fiber crops, 1292, 1630; hay and forage crops, 1609, 88–90, 809, 910, 1907, 2700–1, 3297; irrigation and reclamation, 1827–30, 3588; live stock, 662–3, 1671, 1685, 3200; minor cereals, 524, 2549, 3015, 3102; oil seed plants, 1227, 657, 3297; potatoes, 2901–2; poultry, 2908–11; sugar crops, 3385–6, 2068; tobacco, 3508–10; truck gardening, 1395; wheat, 3730–2. —*Fruits and berrics,* 1377–80; apples, 160–1; cherries, 716; cranberries, 915; currants, 940; dates, 966; figs, 1237; gooseberries, 1488; grapefruit, 1500; grapes, 1501–2; lemons, 1985; limes, 2011; melons, 2195–6; oranges, 2588–90; peaches, 2699; pears, 2701; plums, 2840; raspberries, 2977; strawberries, 3370.

*Education,* 1084, 1086; Carnegie's gifts, 646; chautauquas, 707; colleges and universities, 827–31, 833, 3606; federal aid, 830, 3655–6, 3141; first agricultural college, 2227; first free school, 2168; first state univ., 1882; Gary system, 1401–2; kindergartens, 1924–5, 3141; negroes, 2434–5, 3674, 73; Rockefeller's contributions, 3034; schools, 3138–42; school gardens, 3142–3; school land grants, 1960, 2529; technical and vocational, 3140–1, 3653–6, 47, 997–8.

*Finance and currency,* 2281–4, 3605–6; banks and banking, 327–9, 1230, 2894, 2896; building and loan associations, 528; corporations, 893–4; Farm Loan Board, 1224; gold standard, 2281, 3606; independent treasury established, 2872; national debt, 2399; paper money, 2282, 3605–6; in party politics, 2871; pension system, 2722; silver, free coinage of, 3606, 1499, 2104; tariff, 3437; taxation, 3440–2; trust companies, 3546; U.S. Treasury supervision, 3598.

*Fisheries,* 3590, 1283–6; artificial propagation, 1280–2, 2042, 2615, 3114; in Chesapeake Bay, 2160, 716; clams, 782–3; Great Lakes, 1512; halibut, 1565; herring, 1645; lobsters, 2041, 2042; mackerel, 2102; oysters, 2612, 2614–5; perch, 2726; salmon, 3113–4, 74; "sardines," 3126; seals, 3168, 74; shad, 3188; shrimps, 3225; sturgeon, 3374; trout, 3545; tuna, 3552.

*Foreign trade,* 3591, 852; Argentina, 192; Baltimore, 322; Brazil, 495; Cent. Amer., 680; Charleston, 699; coffee, 822; cotton, 902; Cuba, 937, 1600; Galveston, 1392; Germany, 502; Japan, 1866; Mexico, 2213–4; Mobile, 2274; New Orleans, 2468–9; New York City, 2496; Panama Canal, 3586; San Francisco, 3124; vegetable oils, 1227; wheat, 3732, 1346.

*Geographic features,* 3579–92, 2514–7; Appalachian Highlands, 3877–8, 3880–1; Atlantic Coastal Plain, 3878–80; Central Plains, 3882–4; cities, 3585–6, 3592; climate, 3587–8, 794–5, 2516–7, 1548, 1510; coastline, 2514, 2517, 3647; elevation, *map,* 2514–5; forests, 1327–31, 3590, 3533–4, *map,* 3514–5; geological history, 2516, 3870–1, 1720–1; glaciers, 1465; Great Plains, 3884–5; Gulf Coastal Plain, 3881–2; lakes and rivers, 3581–2, 2515, 3871–3, 1510–4; mountains, 3580–1, 2515, 2516–7, 3870, 158, 3035–6; Pacific coast region, 3887–8; rainfall, 3588, 2516–7, 2973, 2974, 3873, *map,* 2514–5; Rocky Mts. region, 3885–6; vegetation, 3873–4, *map,* 2514–5; western plateaus, 3886–7.

*Lumber and forest products,* 2076–83, 3590, 3583; conservation, 869–70, 1328, 1331; Louisiana, 2070, 2071; paper pulp, 2673; resin, 2997; tar, 3436; turpentine, 3561–2; Washington, 3687. *See also in Index* chief woods by name.

*Manufactures,* 3590, 3585–6, *pictures,* 3589; automobiles, 274, 277, 999; baking, 497–500; buttons, 549, 783; canning and preserving, 631–3, 986–7; confectionery, 628–30, 755–6, 719; clothing, 805–7, 809; dairy products, 708–9, 951–2, 2577–9; dyes, 1049, 1050; flour milling, 1301–4; furniture, 1383, 1385–8; glass, 1471–4; gloves, 1475; hats and caps, 1597–8; iron and steel, 1815–26; matches, 2170–4; meat packing, 2180–5; paper, 2667–73; pens and pencils, 2710–2, 2712–4; petroleum refining, 2753–4, 2576; rope and twine, 3063–5; rubber industry, 3071–6, 69; shipbuilding, 3214–8; shoe and leather industry, 3221–3, 1975–9, 2087; soap, 3263–7; sugar refining, 3386–8; textiles, 902–4, 3236–40, 3782–7.

*Minerals,* 2247, 2248, 3590, *picture,* 2251, *graph,* 3585; asbestos, 225; asphalt, 235; bauxite, 104; borax, 464, 970; cement, 674–6; chalk, 685; clays, 784–5; coal, 811, 812, 814; copper, 882–3, 202, 3610; granite, 1497, 3633; graphite, 1502, 70; gypsum, 1555; helium, 1629; iron, 1817, 1820, 2254; lead, 1974, 2270; limestone, 2010, 1760; marble, 2144, 3632–3; mercury, 2200, 582; mica, 2219; natural gas, 1407–8; petroleum, 2754–5; phosphate rock, 2777, 1235; potash, 2900, 2430; precious stones, 1410, 1001–2; quarrying, 2944–5, 3633; salt, 3115, 2070; silver, 3240–3; slate, 3248; sulphur, 3389, 2070; talc, 3430; tungsten, 3548; uranium and radium, 2960; zinc, 2839–40, 2270.

*Population,* 3579, 3580, *map,* 2514–5; foreign, 3587, *diagram,* 3581; immigration, 1738 (*see also in Index* **Immigration, United States**); Indians, 1774; Mississippi Valley, 3582; negroes, 2434–5, 1432; urban centers, 3591–2.

*Transportation and communications,* 3590–1, 3526; canals, 626–7, 2484, 3130; in early U.S., 3584–5, 582; govt. regulation, 2932, 1794; Great Lakes, 1510–4; Panama Canal, 2663; merchant marine, 3208, 3210, 3212, 3219; railroads, 2962–72; rivers, 3581–2, 1692, 2268, 2572–3; roads, 3024–6; street railways, 3370–2; telegraph systems, 3454; telephone, 3459–61.

**United States Army,** 216–8; in Civil War, 533, 777–8, 779; conscription, 218, 779, 3748, 3801–2; decorations of honor, 976–8; firearms, 1254, 1256; flags, 1287–8; machine guns, 2097; Military Academy, 2236–7; pensions, 2722; physical reconstruction and vocational education, 3653, 3656, 437; in Rev. War, 3002–4, 3615; signal corps, 3233; uniforms, 3575–9; veterans' organizations, 2695; War Dept., 3599; in War of 1812, 3672; in World War, 3801–6, 3748.

**United States Constitution,** 3592–4; Constitutional Convention, 3593, 3677, 2761; "elastic clause," 862; freedom of press, 2918; *habeas corpus,* 1557; Hamilton, 1568–9; interstate commerce, 1794; Jay, 1880; jury trial, 1904–5; Madison, 2107; Marshall, 2155; nationalistic interpretation, 1569, 2155, 3677; opposition to adoption, 16, 1638, 1982, 2306; "New Jersey Plan," 2461; provisions relating to president, 2913–4; ratified by states, 989, 1571, 2107, 2456, 2521, 3009; state governments limited, 3346; states' rights and strict construction, 3347, 1882, 3570; treaty-making power defined, 3529; vice-president, 3636–7. —*Amendments,* 3594, 393; 12th, 3637; 13th, 1140, 780; 14th, 768, 780; 15th, 3385, 780; 16th, 3428; 17th, 3428; 18th, 2921; 19th, 3778.

**United States Government,** 3595–3601; Agriculture Dept., 3597, 3600; bankruptcy laws, 326–7; cabinet, 555, 3595–6; child labor laws, 729; citizenship, 768, 2405; civil service, 774, 776; Commerce Dept., 3597, 3599–3600; congress, 860–2, 3593–4; consular and diplomatic service, 872, 1013; copyright laws, 884; corporation laws, 893–4; counterfeiting laws, 906; counties, 906; courts of justice, 909, 3594, 1906; elections, 1107–8, 2915, 321; employers' liability, 1145; executive boards and commissions, 3601, 3597; Farm Loan Board, 1224; federal govt., powers of, 3593–4, 3595; Federal Reserve Board, 1230; Federal Trade Commission, 1230; food laws, 2936–7, 825, 2182; health service, 1612–5; impeachment of officers, 1740–1; influence of Puritanism, 587; initiative, referendum, and recall, 1778–9; Interior Dept., 3597, 3600–1; Interstate Commerce Commission, 1794; jury system, 1903–5; Justice Dept., 3597, 3601; Labor Dept., 3597, 3600; municipal govt., 2370, 770; Navy Dept., 3597, 3599; patent office, 2692, 2694; police, 2865–8; political parties, 2869–71; poor relief, 2879; Postoffice Dept., 2893–4, 2898, 3507, 3599; president, 2913–4, 3636; prison system, 2920; seamen's laws, 3219; State Dept., 3596, 3597, 3598; state govern-

ments, **3346–7**; suffrage, **3384–5**; taxation, **3440–2**; territories and possessions, **3601** (*see also* under names of separate possessions); townships, **3521, 3008–9**; Treasury Dept., **3597, 3598**; vice-president, **3636–7**; War Dept., **3597, 3599**. *See also in Index* chief entries above by name.

**United States History, 3602–6,** *Study Outline*, **3969**; chief events summarized, **1664–8**; geographic influences, **3581–5, 2515**; table of presidents, **2913**, vice-presidents, **3636**. For period of discovery and exploration *see in Index* **North America.**

*Colonial period* (to 1763), **3602, 1664**; early attempts at colonization, **826, 2520–1**; Jamestown settled, **1861, 3253**; Dutch settle New York, **2496–7, 80**; negro slaves introduced (1619), **3249**; Plymouth founded, **2175–8, 2842**; Massachusetts Bay Colony, **2170, 3757, 472**; New Hampshire settled, **2456**; Puritan immigration to New England, **2937**; Dutch and Swedes settle Delaware, **989**; Maryland founded, **2163**; Connecticut settlements, **867–9, 2456**; Rhode Island founded, **3009, 3742**; New England Confederation (1643), **3592, 3757, 3602**; Carolina founded, **2521**; British capture New Amsterdam (1664), **2497, 3375, 694**; Bacon's Rebellion (1676), **301, 1861**; Penn founds Pennsylvania, **2721–2, 2716–7**; Oglethorpe settles Georgia, **1434**; wars between French and British (1689–1763), **1664, 1362**; Albany Congress, **80, 3592**; migration across Appalachians, **464, 1917, 1920, 3468–9**. —*Social life:* Appalachian barrier checks expansion, **2515**; architecture, **189**; difficulties of travel, **3584, 3526, 3647**; festivals, **759, 3482**; firearms, **1252, 1253**; fireplaces, **3368**; fur trade, **1389**; local govt., **3521, 3648**; music, **2379–80**; postal system, **2896**; Puritan life in New England, **2844–6**; slave trade, **2927**; tobacco trade, **3508**. *See also in Index* separate colonies by name.

*Revolution and formation of the Union* (1763–89), **3602, 1664–5**; Stamp Act, **3337–8, 1358**; independence proclaimed, **975–6**; Revolutionary War, **3000–4**; Continental Congress and Articles of Confederation, **3593, 3347**; Shays' Rebellion, **3197**; Northwest Territory organized, **2528–9**; Washington's work, **3677**; Constitution framed and adopted, **3593**. *See also in Index* **Revolution, American; United States Constitution.**

*National beginnings* (1789–1817), **3602, 3604, 1665**; organization of federal govt., **3677–8**; rise of political parties, **3677, 2870**; financial policy initiated, **3677–8, 1569**; states' rights controversy, **3347, 14**; X Y Z Affair, **3826, 14**; Louisiana Purchase (1803), **2072–3, 1883**; Jeffersonian Republicans victorious, **1882–3**; Lewis and Clark expedition, **1989–90**; gas lighting introduced (1806), **1406**; slave trade abolished (1807), **3249**; beginnings of industrial development, **3007, 2694, 3735, 2388**; early organization of labor, **1947**; growth of foreign trade, **2927, 2166**; settlement of the West, **3581–2, 2567–8, 1758**; steamboat revolutionizes water transportation, **1381, 2268, 2573, 2583**; development of judiciary contributes to national unity, **2155**; disputes with England and France over neutral trade, **3670, 1883**; Embargo Act (1807), **1140, 1883**; War of 1812, **3670–3, 2108**.

*Western expansion and annexation* (1817–54), **3604, 1665–6,** *map*, **3605**; "Era of Good Feeling," **2306–7**; temperance movement initiated, **3465**; Florida purchased, **2306, 1295**; slavery becomes a national issue, **2273, 2307**; "internal improvements" question, **3604, 2306–7, 627, 2484, 3024**; Monroe Doctrine shapes foreign policy, **2307**; rise of Whig and Democratic parties, **15, 2870**; early railroad building, **2963, 2484, 72, 2162**; Jacksonian epoch, **3604, 1856–8, 3616–7**; tariff a live issue, **575–6, 1857, 1240, 2872**; S. Carolina fails to enforce states' rights doctrine, **3348, 3710, 3711**; national bank question settled, **1856–7, 3616, 3571**; Seminole War, **3617, 1773**; western settlement extended, **1803, 2257, 3772**; improvements in farm machinery, **44, 2095**; Webster-Ashburton Treaty (1841), **3571, 2129**; first telegraph line (1844), **3454**; Oregon country acquired (1846), **2872**; Mexican War (1846–48), **2207–8, 2872**; slavery question becomes acute, **2872**; Clayton-Bulwer treaty, **3444, 2653**; "Golden Age" of Amer. literature, **112–4**; European immigration begins, **1738**; origin of women's rights movement, **3778**; gold rush of '49, **3103**; Maine passes first prohibition laws (1850), **2920**; Compromise of 1850, **855–6, 1240**; Gadsden Purchase, **3604, 2802**.

*Civil War and Reconstruction* (1854–77), **3604–5, 1666–7**; Kansas-Nebraska Act reopens slavery question, **1913, 2012, 777, 2802**; Republican party formed, **2870, 2012, 3772**; Dred Scott decision, **1039, 522**; Southern states secede, **857–8**; Civil War, **776–81, 2012–6**; Emancipation Proclamation, **1139–40**; *Trent* Affair, **3539**; reconstruction measures, **780, 1897–8**; Alaska purchased, **74, 79**; French forced to leave Mexico, **1898, 2307, 2216**; *Alabama* claims arbitrated, **73**; panic of 1873 and political corruption, **1499**; Hayes ends reconstruction, **1611**.

*Business expansion and world influence*, **3605–6, 1667–8**; resumption of specie payments and currency question, **3605–6, 1499, 1611, 1592, 2104, 2871**; civil service reform, **1611, 222–3, 790**; development of transcontinental railroads, **2963**; tariff question, **790, 1592, 2103, 2104, 3428, 3437, 3746**; rise of new South, **223, 70, 426–7, 1434, 2519**; growth of "Big Business" **3545, 1826**; govt. regulation of business begun, **1794, 3546, 1592**; Spanish-American War (1898), **3306–7, 2104, 938**; island possessions acquired, **2104, 1605, 3120, 3651**; Panama Canal built, **2653, 2662–3, 3746**; immigration, **1738**; labor movement, **1947, 1487, 1611, 2871, 3600, 3429**; conservation of natural resources begun, **869–70, 3060, 3062**; stricter regulation of business, **3060, 2936, 3746, 1230**; popular control of govt. increased, **2915, 1778–9, 3428**; postal savings bank and parcels post established, **2894, 3428, 329**; Progressive Republican movement (1912), **3429, 2870, 3062**; World War and peace settlement, **3746–9, 3798–3812, 1679–80**; prohibition adopted, **2920–1**; suffrage extended to women, **3778**; Budget Bureau initiates new financial policy, **3598**. —*Foreign relations:* policy of arbitration extended, **172, 521, 79, 3168, 1593**; Monroe Doctrine extended, **2307, 1974**; relations with S. Amer., **3829, 3746, 2307**; Venezuela boundary arbitration, **791**; Mafia dispute with Italy, **1593**; Chilean incident, **1593**; Samoan controversy, **1593, 3120**; Hague Peace Conference, **1559**; policy toward China, **3606, 2104, 3746**; domination of Caribbean, **644, 3606, 2663**; reciprocity with Canada fails (1911), **1971**; Mexican relations, **2217, 2218, 3746**; protectorate over Santo Domingo, **3125, 1560, 3599**; intervention in Haiti, **1560–1, 1582**; "armed neutrality" (1914–17), **3798–3800, 3747**; League of Nations rejected, **1974, 3812**.

For detailed study by administrations *see in Index* names of presidents. *See also in Index* chief topics above by name.

**United States Military Academy, 2236–8**; cadet's uniform, **3578**.

**United States Naval Academy, 2418–9**.

**United States Navy, 2424–6**; battleships of dreadnought type, *pictures*, **2656, 2657, 2426**; cannon, **633**; decorations of honor, **976–8**; ironclads introduced, **2287**, Marine Corps, **2149**; Naval Academy, **2418–9**; Navy Dept., **3597, 3599**; Pacific quadrilateral of defense, **2625**; Panama Canal, **2663**; seaplanes, **60**, *picture*, **63**; signaling system, **3233**; Sims' gunnery reforms, **3243**; uniform, **3578–9, 2426**, *pictures*, **3577**; in War of 1812, **3672**; in World War, **3803, 3518, 3520**.

**United States Steel Corporation, 1826, 646, 3546**; Gary plant, **1401**.

**Units,** electrical, **1116**; heat, **1620, 587**, *picture*, **1619**; power, **3349, 1116**. *See in Index* **Weights and measures.**

**U'nivalve,** mollusk with a one-piece shell, **3201, 3202**.

**Universalists.** Christian denomination which had its beginning in U.S. about 1770; central doctrine is belief in final triumph of good over evil in universe, and salvation of all mankind; membership 60 000.

**Universal languages, 1177**; Latin as, **1965**.

**Universe,** immensity of, **242–7**.

**Universities, 3606, 827–33**; medieval, **831–2, 2608, 2**; oldest in S. Amer., **2009**; oldest in U.S., **588**; Oxford, **2608–11**. *See also in Index* **Colleges and universities.**

**University College,** Oxford, *picture*, **2611**; founded, **2610**.

**University extension, 3140, 831.**

**Unter den Linden,** street in Berlin, **386**.

**Untermeyer** (*un'tĕr-mī-ĕr*). **Louis** (born 1885), Amer. poet, critic, and parodist, b. New York ('The Younger Quire'; '—and Other Poets').

**Untermeyer, Samuel** (born 1858). Amer. lawyer, b. Lynchburg, Va.; counsel in many sensational cases involving exposure of "high finance," and in reorganization committees of large corporations; aided preparation of federal currency and trust legislation; ardent Wilson supporter; assisted in Lockwood Committee investigation (1921) of conspiracy in N.Y. City building trades.

**Unterwalden** (*un'tĕr-väl-dĕn*), Swiss canton, **3415, 3464**.

**Unwin, Mary,** friend of Cowper, **911**.

**Unwritten law, 1972.**

**Upan'ishads,** Hindu poems, **1755**.

**U'pas tree,** tropical tree of the mulberry family, **1877, 3532–3**.

**Upland cotton, 906.**

**Upland plover,** a sandpiper, **2839**.

**Uplands,** region in Scotland, **3146**.

**Upolu** (*u̧'pō-lu̧*), 2d largest of Samoan Isls.; 600 sq. mi.; **3120**; Stevenson's grave, **3356**.

**Upper Austria.** A province in n.w. of Austria; 4628 sq. mi.; pop. 860,000; cap. Linz (95,000).

**Upper Canada,** former name of Ontario, **2583**.

**Upper Egypt, 1093–4**.

**Upper Iowa University.** At Fayette, Iowa; co-ed., Meth. Episc.; established 1857; liberal arts, normal school, music, art, business.

**Upper Senegal-Niger.** *See in Index* **Sudan, French.**

**Upper Silesia.** A region embracing the s.e. portion of former Prussian province of Silesia; over 4100 sq. mi.; pop. 2,600,000. *See in Index* **Silesia.**

**Upsala** (*up-sä'lä*) or **Uppsala,** a cathedral city of Sweden, 41 mi. n. of Stockholm on Fyris R.; pop. 29,000; **3402**; Ulfilas' Bible manuscript, **390**.

**Ur** (*ûr*), anc. city of s. Babylonia near Euphrates R.; site marked by ruin mounds; original home of Abraham, **2.**
**U'ral Mts.,** low range in Russia forming part of boundary between Europe and Asia; 16,000 mi. long; **3606–7, 1190.**
**Ural River,** in s.e. Russia; rises in Ural Mts. and Orenburg; flows w. and s. 1485 mi. into Caspian Sea; *map*, **1196–7.**
**Ural-Altaic, 3557.**
**Ura'nia,** in Gk. myth., muse of astronomy, **2373,** *picture*, **156.**
**Ura'nium,** the heaviest known element, **4042;** colors glass, **1472;** purified by thermit, **105;** radioactive properties, **2959;** U.S. ores, **2960, 841.**
**U'ranus,** in Gk. myth., the first ruler of the world, **3607.**
**Uranus,** a planet, **2818, 2815;** and discovery of Neptune, **244–7;** orbit, speed, and size, *pictures*. **2816.**
**Ur'ban I,** pope 222–230, **3607.**
**Urban II** (1042?–99), pope, **3607;** urges crusade, **929.**
**Urban III.** Pope 1185–87.
**Urban IV.** Pope 1261–64.
**Urban V** (1309–70), pope, **3607.**
**Urban VI** (1318–89), pope, **3607.**
**Urban VII** (1521–90), pope, **3607.**
**Urban VIII** (1568–1644), pope, **3607, 1842.**
**Urban'a,** Ill., city 120 mi. s.w. of Chicago in rich farming dist.; pop. 10,244; r.r. shops; foundries and machine shops; state univ.; *picture*, **1736.**
**Urbino** (*ụr-bē'nō*). Town in cent. Italy; pop. 7000; cap. of former duchy of Urbino; celebrated center of art and literature in 15th and 16th cents.; birthplace of Raphael, now a museum; beautiful palace.
**Ur'du,** a language of India, **1748.**
**U'rea,** the principal solid in mammalian urine; excreted by kidneys, **1922;** formed by liver, **2031.**
**U'Ren, William Simon** (born 1859), Amer. lawyer and reformer, **1779.**
**Ur'ga,** chief town of Mongolia; pop. 40,000; **2285.**
**Uri** (*ụ'rē*), Swiss canton, **3414, 3464.**
**Uriah** (*yụ-rī'à*). Officer in David's army, husband of Bathsheba; sent by David to the front to die (II Sam. xi, 15).
**U'rial** or **sha,** wild sheep, **3199.**
**U'rim and Thum'mim, 2326.**
**U'rine,** the excretion of the kidneys, **1922, 1469;** affected by pituitary gland, **1470.**
**Ur'mia** or **Urumi'ah,** town of n.w. Persia 70 mi. s.w. of Tabriz near L. Urmia; pop. 35,000; traditional birthplace of Zoroaster; Armenians massacred by Turks 1915; **2735.**
**Urmia Lake,** Persia, **2735.**
**Ur'sa Major** or **Great Bear,** a constellation; legend, **872;** location, *chart*, **873;** spiral nebula, **2432.**
**Ursa Minor** or **Little Bear,** a constellation; legend of, **872;** location, *chart*, **873.**
**Ursi'nus College.** At Collegeville, Pa.; co-ed.; founded 1869; in affiliation with the Reformed Church in the U.S.; arts and science.
**Ur'sula, Saint** (3d or 5th cent. A.D.), legendary virgin martyr; said to have been massacred with 11,000 companions by the Huns; church at Cologne, **834.**
**Ur'sulines.** Rom. Cath. religious order founded by St. Angela Merici of Brescia (1470–1540) primarily for education of girls and care of sick; patron St. Ursula.
**Ur'sus,** the bear genus of carnivores, **350, 355.**
**Ursus horribilis,** grizzly bear, **350.**
**Urticaceae** (*ûr-tĭ-kā'sē-ē*) or **nettle family,** family of herbs and vines with hairy stems and primitive flowers, **3940;** includes nettles, **2443,** hops, **1680.**
**Uruguay** (*yụ'rụ-gwā*), smallest of the S. Amer. republics; 72,200 sq. mi.; pop. 1,460,000; **3607–9,** *maps*, **3288–9, 3608;** cap. Montevideo, **2316;** Plata R., **2831.**
**Uruguay,** a river of S. Amer. rising in s.e. Brazil and flowing 1000 mi. to the Plata R.; boundary between Argentina on w. and Brazil and Uruguay on e.; **3608, 2831.**
**Urumchi** (*ụ-rụm'chē*). Cap. of Sinkiang province, China, n. of Tien Shan Mts. on caravan route from Peking; pop. 30,000; wireless station.
**Uskup** (*üs-küp'*) or **Skoplje,** Jugo-Slavia. Serbian trade town 65 mi. n. of Monastir; pop. 48,000; formerly Turkish; captured by Serbs in Balkan Wars, by Bulgarians 1915; leather, dyestuffs, textile mfrs.
**Ussh'er** or **Usher, James** (1581–1656), author of a biblical chronology printed in margins of Authorized Version, **964.**
**Usti** (*ụ'stē*). *See in Index* **Aussig.**
**Utah** (*yụ'tą*), a w.-cent. state of U.S.; 84,990 sq. mi.; pop. 449,396; **3609–12,** *maps*, **3610, 3584–5;** cap. Salt Lake City, **3116, 3118;** cliff dwellers, **793–4;** Great Salt Lake, **1515;** national parks, **2400;** origin of name, **3347;** minerals, **3610, 3612, 882, 2900, 2960;** physical features, **3609–10;** state flower, **3347.**—*History*, **3612;** ceded to U.S., **2872;** Mormons settle, **2327;** cricket plague (1850), **1550;** Compromise of 1850, **855–6;** woman suffrage, **3778.**
**Utah, University of,** co-ed. state institution at Salt Lake City, Utah; founded 1850 as University of the State of Deseret; arts and science, education, mines, medicine, law; *picture*, **3611.**
**Utah Lake,** largest fresh-water lake in Utah, 30 mi. s.e. of Great Salt Lake; 23 mi. long; *map*, **3610.**
**Utamaro** (*ụ-tà-mä'rō*), **Kitagawa** (1754–1806), Japanese designer of color-prints; called by contemporaries "great master of the Popular School"; **1876.**
**Utes** (*yụts*), tribe of Indians formerly occupying mt. region of w. Colorado and e. Utah, **1767.**
**Uther** (*yụ'thēr*), **King,** in Arthurian legends, **223, 224.**
**Utica** (*yụ'tĭ-kà*), anc. Phoenician city on n. coast of Africa; sided with Rome in Third Punic War and succeeded Carthage as leading city of Africa; scene of last stand of Pompeians against Caesar and of suicide of younger Cato (46 B.C.); **3549.**
**Utica,** N.Y. City 45 mi. e. of Syracuse on Mohawk R. and Erie Canal; pop. 94,156; center of dairy farming region; diversified mfrs. including textiles, clothing, iron and steel products.
**Utilita'rians,** in philosophy, **2772.**
**Ut-Napishtim** (*ụt-nä-pish'tĭm*), the Babylonian Noah, **299.**
**'Utopia',** romance by Sir Thomas More, **2325–6, 1164.**
**Uto'pian socialism, 3268, 2157.**
**Utrecht** (*ü'trekt*), Netherlands, quaint historic Dutch city on Rhine R.; pop. 140,000; **3612, 2441.**
**Utrecht, Treaty of** (1713), **3612, 2450.**
**Utrecht, Union of, 3612, 2442.**
**Uxmal** (*ụz-mäl'*), Mexico. Anc. ruined city in n.w. Yucatan, 60 mi. s.w. of Merida; remarkable remains of Maya architecture.
**Uz,** home of Job, **1894.**

# V

YOU must have noticed how often on inscriptions in stone, on memorial tablets and public buildings, U is made in the shape of a V. This gives the inscription an air of antiquity, for the U was originally made in that way on Greek and Roman inscriptions, since it was easier to cut with the chisel. The story of how the two letters V and U developed is told under U. The characters V and U were used for the same sound in Latin, Norman-French, and English as late as the Elizabethan period and they were counted as one in alphabetic arrangements. V was commonly called "single U" as W was "double U" as late as the beginning of the 17th century. The sound of *v* in Latin was like our *w*. Our *v* sound seems to have been wanting in Greek and Latin.

**Vaal** (*väl*) (Dutch "yellow"), r. in S. Africa, rises on w. slope of Drakensberg; flows w. 500 mi. to Orange R., of which it is chief tributary; **2590, 3526,** *map,* **3282.**

**Vacation schools, 3140.**

**Vaccination** (*văk-sĭ-nā'shŏn*) or **vaccine therapy,** preventing or treating disease with vaccines, **151–2, 3613.**

**Vaccine** (*văk'sĭn*), **151–2, 3613.**

**Vac'cinium,** cranberry and blueberry genus of plants, **915.**

**Vacuum** (*văk'yu-ŭm*), **3614;** causes thunder, **2006;** how it "lifts" the airplane, **66,** *picture,* **58.**

**Vacuum** or **pneumatic appliances, 2846–7.**

**Vacuum bottle, 3614.**

**Vacuum cleaner, 3614.**

**Vacuum heating systems, 1622, 1624.**

**Vacuum pan,** an evaporating device, **3614;** in sugar-making, **3386,** *picture,* **3387.**

**Vacuum** or **air pump, 2934;** experiments with, **53.**

**Vacuum** or **Crookes tube, 3824,** *picture,* **3825.**

**Vacuum valve** or **audion, 257, 3762,** *pictures,* **3759, 3761, 1799.**

**Vaea, Mt.,** Samoa, **3356, 3120.**

**Vagus** (*vā'gŭs*) or **pneumogastric nerve.** Mixed nerve descending from medulla oblongata through the carotid sheath and branching to the various internal organs; also called the tenth cranial nerve.

**Vailima** (*vī-lē'mȧ*), Stevenson's Samoan home, **3356, 3120.**

**Vaisyas** (*vī'syas*), farmer caste among Hindus, **1651, 1750.**

**Valais** (*vă-lā'*). Canton of s.w. Switzerland, 2027 sq. mi.; pop. 128,000; magnificent Alpine peaks; tourist resorts; many minerals, and wines well known, but most of area is pastoral.

**Valdai** (*väl-dī'*) **Hills,** Russia, groups of low hills and plateaus midway between Petrograd and Moscow; form water-parting for chief river systems of country; 800 to 900 ft.; **3085,** *map,* **1190–1.**

**Valdés** (*väl-dās'*). **Juan de** (1500–41). Span. author, one of foremost Span. writers of prose; dealt with problems of biblical interpretation and their bearing on devout life.

**Valdez, Pedro de,** Span. naval officer, **1031.**

**Valdivia** (*väl-dē'vē-ä*), Chile. City 480 mi. s. of Valparaiso and 15 mi. from coast, on Valdivia R.; pop. 28,000; coasting trade

**Valdos'ta,** Ga. City in s.-center, in cotton- and fruit-growing region; pop. 10,783; cotton and lumber products.

**Valence** (*vă-läńs'*), France (Rom. Valencia), historic town 57 mi. s. of Lyons, on Rhone R.; pop. 28,000; printed fabrics, flour, tinned foods; vineyards; **3012.**

**Va'lence,** combining power of a chemical element, **4039.**

**Valencia** (*vă-lĕn'shĭ-a*), province of Spain, on e. coast; 4150 sq. mi.; pop. 924,000; agriculture, grazing, fisheries, silk culture; cap. Valencia; **3302.**

**Valencia,** third largest city of Spain; pop. 245,000; **3614–5.**

**Valencia,** Venezuela. City 24 mi. s. of Puerto Cabello; pop. 55,000; trade in sugar, coffee, cacao, hides; cotton mills.

**Valenciennes** (*vä-läń-syĕn'*), France. Industrial town 28 mi. s.e. of Lille on Scheldt R. in coal district; pop. 35,000; famous lace no longer made here; taken by Germans 1914.

**Valenciennes lace, 1950.**

**Va'lens** (328?–378), Byzantine emperor, chosen 364 by his brother Valentinian I to rule East; warred with Persians and Goths; defeated at Adrianople, **26, 1491.**

**Valentia** (*vă-lĕn'shĭ-ȧ*) **Island.** Off s.w. coast of Ireland; terminus of cables between Amer. and Gt. Brit.

**Val'entine, Saint,** Christian martyr of 3d cent., whose feast day falls on February 14, **3111.**

**Valentine's Day, 3111.**

**Valentin'ian I** (321–375). Rom. emperor, son of humble parents, who rose to high rank in army and was elected emperor 364; a firm, impartial, tolerant ruler.

**Valentinian III** (419?–455). Rom. emperor, succeeded 425, during whose reign Africa, Sicily, Gaul, and Britain were lost; murdered Aetius, and was himself murdered following year; a weak contemptible figure.

**Valera, Eamon de.** *See in Index* **De Valera.**

**Valera** (*vä-lā'rä*), **Juan** (1824–1905). Span. statesman and eminent man of letters; his 'Pepita Jiménez', marked the renaissance of the modern Span. novel.

**Vale'rian** (Publius Licinius Valerianus). Rom. emperor 253–260, elected by army when he was over 60; zealous worker but overwhelmed by constant fighting with barbarians and Persians; defeated by Persians 260 A.D. and held prisoner until his death.

**Valerianos, Apostolos.** *See in Index* **Fuca, Juan de.**

**Valerian Way.** A principal highway of anc. Italy; continued Tiburtina Way (Rome to Tivoli) n.e. to Adriatic.

**Valhalla** (*văl-hăl'ȧ*), in Norse myth., hall of slain warriors in heaven, **2560, 3135.**

**Valjean** (*väl-zhäń'*), **Jean,** hero of 'Les Miserables', **1695–6.**

**Valkyries** (*văl-kĭr'ēz*) or **Valkyrs,** "choosers of the slain," in Norse myth., maidens who conduct souls of slain heroes to Valhalla, **2560.**

**Valladolid** (*väl-yä-thō-lēth'*). Spain. Former cap., 95 mi. n.w. of Madrid; pop. 71,000; Columbus died here; home of Cervantes, birthplace of Philip II; varied mfrs.; univ.

**Vallandigham** (*vă-lăn'dĭ-găm*), **Clement L.** (1820–71), Amer. Civil War "copperhead," b. New Lisbon, Ohio; convicted of sedition by military court 1863; sentence of imprisonment commuted by Lincoln to banishment to Confederate states; subsequently supreme commander Knights of the Golden Circle; **781.**

**Vallejo** (*vă-lā'hō*). Calif. City on arm of San Pablo Bay, 25 mi. n.e. of San Francisco; pop. 21,107; opposite Mare Isl. Navy Yard; flour, leather, cement, canned fish, lumber products, and canned fruits; quicksilver mine near by.

**Vallet'ta,** chief town and port of isl. of Malta; pop. 25,000; large trade; winter resort; **2131.**

**Valley, 3615, 2790–1,** *pictures,* **2789;** dew, **1000;** "mountain-and-valley" breeze, **3751.**

**Valley City,** N.D. City in s.e., 50 mi. w. of Fargo, in agricultural and stock-raising region; pop. 4686; state normal school.

**Valleyfield,** Quebec. Industrial city and port on St. Lawrence R. at head of Beauharnois Canal, 40 mi. s.w. of Montreal; pop. 9500; cotton, flour, and paper mills, bronze and aluminum works, foundries, sash and door factories.

**Valley Forge,** Pa., village on Schuylkill R. 20 mi. n.w. of Philadelphia; winter quarters of Washington's army (1777–78); **3615, 3003, 3676;** Steuben at, **3355.**

**Valley of Death,** Utah, **3610.**

**Vallombrosa** (*văl-ŏm-brō'sȧ*), Italy. Summer resort in Apennines 20 mi. s.e. of Florence; Vallombrosian order of monks, founded 11th cent., now extinct; monastery occupied by Royal School of Forestry.

**Valmy** (*väl-mē'*), France, village 40 mi. s.e. of Reims; battle between army of Fr. Rev. govt. and First Coalition (1792), **1370.**

**Valois** (*vă-lwä'*), **Margaret of.** *See in Index* **Margaret of Valois.**

**Valois.** Old dist. of n.cent. France now comprised in departments of Oise and Aisne; countship in Middle Ages; later united to crown; home of House of Valois.

**Valois, House of,** Fr. dynasty, branch of Capetian family; reigned 1328–1589; began with Philip VI. **2763.** *See also in Index* list of rulers of France, under **France.**

**Valona,** Albania. Same as **Avlona.**

**Valo'nia,** acorn cup of valonia oak; used in tanning, **1976.**

**Valorization,** the fixing or maintenance of price of a commodity by govt. aid; of coffee, **495.**

**Valparaiso** (*văl-pä-rī'zō*), Chile, chief Pacific port s. of San Francisco; pop. 215,000; **3615**; bombarded, **738.**

**Valparaiso,** Ind. City 40 mi. s.e. of Chicago; pop. 6518; Valparaiso Univ.; trade in farm products.

**Valtelline** (*văl-tĕl-lē'nā*). Fertile upper valley of Adda R. in n. Italy, much fought over by anc. and medieval powers; wines and honey; mineral springs; ruled by Austria 1814–59.

**Valves,** electric or vacuum, **257,** *pictures,* **3759, 3761**; in gas engine, **1404, 280, 281,** *picture,* **1405**; of heart, **1616**; in pumps, **2934,** *pictures,* **2935**; slide-valve of steam engine, **3351, 3348.**

**Vampire,** in myth., **346.**

**Vampire bats, 346.**

**Van.** Town in s. Armenia near L. Van; pop. 35,000; Amer. missions and schools; scene of massacres by Turks.

**Van, Lake,** large salt lake of s.e. Armenia; 1400 sq. mi.; no outlet; **213.**

**Vana'dium,** a silvery metallic element, **4042**; alloyed with steel, **99**; found in Mexico, **2210**; in Peru, **3289.**

**Vanbrugh** (*văn-brụ'*), **Sir John** (1664–1726), Eng. dramatist and architect, one of leading wits of his day; designed Blenheim Palace and many mansions for Eng. nobility; **1036.**

**Van Bu'ren, Martin** (1782–1862), 8th president of U.S., **3616–7**; financial panic (1837), **3616, 1857**; "Aroostook War," **3617, 2129**; "hard cider" campaign, **1594.**

**Vancouver** (*văn-kụ'vẽr*), **George** (1758?–98), Eng. navigator, served under Cook on 2d and 3d voyages; explores Vancouver Isl.: **3617.**

**Vancouver,** chief city of Brit. Columbia; pop. 115,000; **3617, 513,** *picture,* **609.**

**Vancouver,** Wash., port on Columbia R. 8 mi. n. of Portland; pop. 12,637; shipbuilding; ships fruit (prunes), dairy products; Vancouver Barracks; early history, **2597–8.**

**Vancouver Island,** Brit. Columbia, largest Isl. off w. coast of America; 20,000 sq. mi.; **3617, 617,** *map,* **602–3**; logging train, *picture,* **606.**

**Vanda'lia,** Ill., city on Kaskaskia R. 60 mi. n.e. of St. Louis, Mo.; pop. 3316; **1736.**

**Van'dals,** Ger. tribe, **3617–8**; in Africa, **2328**; sack Rome (455 A.D.), **3057**; in Spain, **3303.**

**Van'derbilt, Cornelius** (1794–1877). Amer. capitalist and financier, b. Staten Isl., N.Y., founder of the Vanderbilt fortune; nicknamed "Commodore" for his early steamboat activities; acquired control of New York Central R. R., to which his son, W. H. Vanderbilt, and grandsons added others.

**Vanderbilt University.** At Nashville, Tenn.; co-ed.; founded 1873 by Cornelius Vanderbilt under auspices of Meth. Episc. Church South; arts and science, law, medicine, engineering.

**Van'derlip, Frank Arthur** (born 1864). Amer. banker, b. Aurora, Ill.; assistant sec. of treasury 1897–1901; chairman War Savings Committee during World War.

**Van der Weyden** (*vī'dĕn*), **Roger** (1400?–64), Flemish painter, also known as Roger de la Pasture; pictures distinguished by profoundly religious spirit ('Descent from the Cross'; 'Madonna with Saints'); **2630.**

**Van Diemen's** (*dē'mĕnz*) **Land.** Former name of **Tasmania.**

**Van Dyck** (*dĭk*) or **Van Dyke, Sir Anthony** (1599–1641). greatest of Flemish portrait painters, **3618, 2631**; pupil of Rubens, **3076**; 'William of Orange and Mary', *picture,* **2636.**

**Van Dyke, Henry** (born 1852), Amer. Presb. clergyman and author, b. Germantown, Pa.; professor of Eng. literature at Princeton Univ. ('The Blue Flower'; 'Fisherman's Luck'); quoted, **116, 1344.**

**Vane, Sir Henry** (1613–62). Eng. Puritan statesman, friend of religious liberty; gov. of Massachusetts 1636–37; returned to England; active Parliamentarian; imprisoned at Restoration and beheaded for treason.

**Vane,** of feather, **1228.**

**Väner.** Same as **Wenner.**

**"Vanes'sa,"** poetical name given by Swift to Esther Vanhomrigh (1692–1723), **3406.**

**Vanessa,** a genus of butterflies, *picture,* **548.**

**Van Eyck** (*īk*), **Hubert** (1366?–1426), Flemish portrait and landscape painter, who with his brother Jan (1385?–1440) introduced aerial perspective and landscape backgrounds, **2630, 2629, 520.**

**Vanhomrigh, Esther.** *See in Index* **Vanessa.**

**Vanil'la,** a flavoring substance, **3619, 3317,** *picture,* **3319**; coal-tar substitute, **814.**

**Vanil'lin,** the active ingredient of vanilla, **3619.**

**Vanity Fair,** in Bunyan's 'Pilgrim's Progress', **538.**

**'Vanity Fair',** novel by Thackeray, **3479, 2540.**

**Van Loon, Hendrik Willem** (born 1882). Dutch-Amer. historian and illustrator, b. Rotterdam, Netherlands ('Story of Mankind'—vivid, charming history for children).

**Vannes** (*vän*), France. Quaint old town 67 mi. n.w. of Nantes; pop. 18,000; anc. cap. Veniti, taken by Caesar 56 B.C.; rich prehistoric remains; makes fabrics, leather, iron.

**Van Rensselaer** (*rĕn'sẽ-lẽr*), **Killian** (1595–1644), first Dutch patroon of New York, one of founders of New York and Albany, **80.**

**Van Rensselaer, Stephen** (1764–1839). Amer. political leader and soldier, last of Dutch patroons; ardent promoter of Erie Canal; founded Rensselaer Polytechnic Institute.

**Van't Hoff** (*vänt hŏf*), **Jacobus Hendricus** (1852–1908). Dutch chemist and physicist, founder of sterochemistry and first Nobel prize winner (1901) in chemistry.

**Van Tromp.** *See in Index* **Tromp.**

**Vanua Levu** (*vä'nụ-ä lā'vụ*), one of Fiji Isls.; 2130 sq. mi.; **1239.**

**Vaphio cup,** *picture,* **28.**

**Va'por,** gaseous form of a substance normally solid or liquid, **1403**; water vapor in air, **1207.**

**Vapor heating systems, 1622, 1624.**

**Varan'gians,** Slav name for the Norse invaders of Russia (9th cent.); Varangian guard, **2528.**

**Varennes-en-Argonne** (*vä-rĕn'zŏn-är-gŏn'*), small town 18 mi. n.w. of Verdun, on Aire R.; taken by Americans on first day of Meuse-Argonne offensive; Louis XVI and family captured, **1368.**

**Variable star, 3343, 3340.**

**Variation of compass, 854,** *picture,* **855.**

**Vari'ety,** in plant and animal classification, **412.**

**Var'na.** Chief port of Bulgaria, on Black Sea; pop. 42,000; anc. Odessus; cotton mills; exports cattle, grain.

**Varnhagen von Ense** (*färn'hä-gĕn fŏn ĕn'sẽ*), **Rahel** (1771–1833). Ger. author remembered for her letters and for her influence on A. von Humboldt, Goethe, Carlyle, and other literary men; her salon in Berlin was the most important in Germany; her husband, Karl (1785–1858), wrote historical and literary sketches of permanent value.

**Varnish, 3619, 2643.** *See also in Index* **Paints and varnishes.**

**Varro** (*văr'ō*), **Marcus Terentius** (116–27 B.C.). Rom. historian and soldier, "most learned of the Romans"; most of writings lost.

**Varus** (*vā'rŭs*), **Publius Quintilius.** Rom. general whose defeat by Arminius in the Teutoburg Forest (9 A.D.) limited Rom. empire to the Rhine. Varus killed himself in despair and the Emperor Augustus cried in anguish at the news: "Varus, Varus, give me back my legions!"

**Varying hare** or **snow-shoe rabbit, 1584–5.**

**Vasa** (*vä'sä*). Swedish royal house beginning with Gustavus I, 1523, and ending with Christina, 1654. For list *see in Index* **Sweden.**

**Vasari** (*vä-sä'rē*). **Giorgio** (1511–74), Ital. author, painter, and architect (Uffizi Palace, Florence), biographer and "father of modern art history and criticism" ('Lives of the Most Eminent Painters, Sculptors, and Architects', a classic despite inaccuracies); account of Raphael, **2976.**

**Vas'cular** or **circulatory system,** of human body, **438, 1617**; palms, **3532**; trees, **3532,** *picture,* **3531.**

**Vas'eline,** trade name for petrolatum, **2754.**

**Vases, 2903–4,** *pictures,* **2904, 2906**; Aegean, *picture,* **28**; Chinese, *picture,* **2881**; famous examples, *pictures,* **1203–6**; Greek, **1529,** *picture,* **1526**; Japanese, *pictures,* **1147, 1874.**

**Vashti** (*văsh'tī*). Queen of Ahasuerus, king of Persia, put aside for disobedience (Book of Esther).

**Vas'sals,** in feudal system, **1236.**

**Vassar** (*văs'ar*), **Matthew** (1792–1868). Amer. brewer and philanthropist, b. England; gave 200 acres of land and $788,000 to found Vassar College.

**Vassar College,** at Poughkeepsie, N.Y.; women, non-sect.; incorporated 1861; arts and science; *picture,* **2485, 829.**

**'Vaterland'** or **'Leviathan',** an ocean liner, **3218.**

**Vat'ican,** palace of the pope at Rome, **2666,** *picture,* **187**; art treasures, **1201–2, 2976**; library, **1992,** *picture,* **2665,** made official residence, **1838.** *See also in Index* **Sistine Chapel.**

**Vatican Council, 764.**

**Vatican manuscript of Bible, 390.**

**Vauban** (*vō-bäṅ'*), **Sébastien le Prestre de** (1638–1707). Marshal of France, most celebrated of military engineers.

**Vaudois** (*vō-dwä'*). Same as **Waldenses.**

**Vaudreuil-Cavagnal** (*vō-drû'y-kä-vä-nyäl'*), **Pierre François, Marquis of** (1698–1765). Last Fr. gov.-gen. of Canada, succeeding Duquesne in 1755; his father, Philippe (1641?–1725), was appointed gov.-gen. in 1703.

**Vaughan** (*vạn*), **Herbert** (1832–1903). Eng. Rom. Cath. prelate, Manning's successor as cardinal and archbishop of Westminster: known for his support of temperance movement and interest in commercial education (founded St. Bede's College, Manchester).

**Vaughan, Phineas W.,** Amer. inventor, **3758.**

**Vault,** room or passage with arched roof, **174**; Roman, **177**; fan vaulting, **187–8**; Gothic, **186,** *picture,* **187**; Romanesque, **180.**

**Vauxhall** (*vạks-hạl'*) **Gardens,** London. On Thames R., built 1661; fashionable resort; closed 1859 and site built over.

**Vecchio** (*vĕk'ĸĕ-ō*) **Palace** (Old Palace), Florence, **1849.**

**Vecht** (*vĕĸt*) **River,** arm of the Rhine, 18 mi. long, **3612.**

**Vedas** (*vā'dăs*), sacred writing of Hindus, **1651, 1755.**

**Ved'dahs,** a people of Ceylon, **685.**

**Ved'der, Elihu** (born 1836). Amer. painter and illustrator, b. New York City ('Cumaean Sibyl'; illustrations for Omar Khayyam).
**Veer'y,** a thrush, **3494.**
**Vega** (*vē'gȧ*), a fixed star, **3342, 3343, 1064.**
**Vega Carpio** (*vā'gä kär'pē-ō*), **Lope Felix de** (1562–1635), generally called Lope de Vega, Span. dramatist and poet, **3307;** chief works, **1038.**
**Vegetable ivory.** *See in Index* **Tagua.**
**Vegetable marrow,** a squash, **3333.**
**Vegetable oils, 1225, 1227.**
**Vegetables,** edible plants or plant parts; canning, **631–3;** cooking, **877;** dehydrated, **986–7;** digestion of, **1011;** food value, **1320, 1321;** home gardening, **1394–5, 1397.** *See in Index* **Food; Food values; Gardens and gardening.**
**Vegetation,** of Africa, *map,* **40–1;** Asia, *map,* **232–3;** Australia, *map,* **264–5;** Europe, *map,* **1190–1;** N. Amer., *map,* **2514–5;** S. Amer., *map,* **3288–9.**
**Ve'hicles,** invention of wheeled, **3524.** *See also in Index* **Transportation.**
**Veii** (*vē'yī*), Italy, anc. Etruscan stronghold, **3042, 3044.**
**Veile** (*vī'lē*), picturesque town of Denmark; pop. 15,000; **996.**
**Veiled Prophet's Pageant,** St. Louis, **3110.**
**Veins** (*vānz*), of body, **438;** how to stop bleeding, **1270;** portal, **2031;** pulmonary, *pictures,* **2083, 1616;** vena cava, *picture,* **1616.**
**Veins,** in plants, **1980, 1306, 1307.**
**Velasquez** (*vä-läs'kĕth*), **Diego** (1465?–1522?), Span. soldier; accompanied Columbus to W. Indies on 2d voyage; founds Havana, **1600.**
**Velasquez, Diego Rodri'guez de Silvay** (1599–1660), Span. painter, **3619–20, 2631;** and Murillo, **2372;** 'Don Balthasar Carlos', *picture,* **2636.**
**Veld** (*vĕlt*) or **veldt,** plains in S. Africa, **34, 3279, 3283.**
**Vel'lum,** a fine parchment, **2667;** drum heads, **1042.**
**Veloc'ipede,** form of bicycle, **391.**
**Veloc'ity,** in physics, **4028;** of sound, **4031.**
**Velocity turbines, 3554.**
**Velvet,** a fabric, **804;** introduced into Europe, **932.**
**Velvet,** of deer antlers, **979,** *picture,* **981.**
**Velvet ant,** a wingless wasp, **3693.**
**Velveteen', 804.**
**Ve'na ca'va,** *picture,* **1616.**
**Vendée** (*vän-dā'*). Maritime dept. of w. France; 2690 sq. mi.; pop. 440,000; center of royalist revolt (1792–93) against Fr. republic.
**Vendet'ta,** a blood-feud, in Corsica, **894.**
**Vendôme** (*vän-dōm'*), Fr. town 35 mi. n.e. of Tours; pop. 10,000; ruins of 11th cent. castle of Counts of Vendôme; birthplace of Rochambeau; glove-making, **1475.**
**Vendôme Column,** in Paris, **2682, 2685.**
**Veneer', 3620.**
**Venetia** (*vĕ-nē'shī-ȧ*), dist. in n. Italy between Alps and Adriatic; anc. Rom. province; long ruled by Venice; went to Austria (1797); **1840, 1838, 1354.**
**Venezia** (*vā-nä'tsē-ä*), Ital. name for Venice.
**Venezuela** (*vĕn-ĕ-zwē'lȧ*), **United States of,** a republic of S. Amer. on the Caribbean Sea; 394,000 sq. mi.; pop. 3,000,000; cap. Carácas; **3620–3,** *maps,* **3622, 3288–9;** asphalt, **235, 3622;** elevation, *map,* **3288–9;** Orinoco R., **2600, 3621;** people, **3622,** *pictures,* **3623, 3287;** population, *map,* **3288–9;** rainfall, *map,* **3288–9;** vegetation, *map,* **3288–9.** *—History,* **3622–3;** Bolivar leads insurrection, **448;** boundary disputes with Germany, **3623, 2307, 3062;** with Gt. Brit., **3622–3, 791, 172.**
**Venezuela, Gulf of,** or **Gulf of Maracaibo,** inlet of Caribbean Sea in n.w. Venezuela, **3621,** *map,* **3622.**
**Ven'ice,** Calif. Resort city on Pacific, 12 mi. w. of Los Angeles; pop. 10,385; planned after Venice, Italy, with system of street canals; formerly called Ocean Park.
**Venice,** Italy, city built on 117 small isls. in a bay of the Adriatic Sea; pop. 168,000; **3623–5, 1850–3;** first commercial bank, **329;** Grand Canal, *pictures,* **517, 1851, 3624;** medieval trade and industry, **3317, 3385, 1474;** St. Mark's Cathedral, **3623–4, 1851–2,** *pictures,* **1197, 182,** (bell-tower), **377,** *pictures,* **182, 1851;** scenes portrayed by Titian, **3505;** 16th-cent. "newspaper," **2474;** tide, **1188;** "wedding the Adriatic," **26.**
**"Venice of the Netherlands," 119.**
**"Venice of the North," 3357.**
**Venizelos** (*vā-nē-zä'lōs*), **Eleutherios** (born 1864), Gk. statesman, **3625–6, 1526, 3806.**
**Venom,** snake poison, **3260.**
**Venous blood, 438.**
**Ventilation.** *See in Index* **Heating and ventilation.**
**Ventricle,** cavity in an organ; of brain, **491;** of heart, **1616.**
**Ventu'ri meter,** for measuring water, **2206.**
**Ve'nus,** Rom. goddess of love and beauty, identified with Gk. Aphrodite, **3626, 155;** and Psyche, **939–40.**
**Venus,** a planet, **2817,** *pictures,* **2819;** lacks satellites, **2818;** orbit, **2815,** *pictures,* **2816.**
**Venusberg,** in Tannhäuser legend, **3433.**
**Venus de Milo,** statue, **155, 1530,** *picture,* **1203.**
**Venus's flower-basket,** a sponge, **3328, 3330.**
**Venus's fly-trap,** an insect-eating plant, **3626, 2829.**
**Venus shell, 3202.**
**Vera Cruz** (*vā'rä krŭz*), Mexico. State in e. on Gulf of Mexico; 27,880 sq. mi.; pop. 1,170,000; cap. Cordoba; chief port Vera Cruz.
**Vera Cruz,** Mexico, principal port on the Gulf of Mexico; directly e. of Mexico City; pop. 50,000; **3626–7;** harbor, **2209;** captured by Scott (1847), **2208;** U.S. occupies (1914), **2217.**
**Verb,** in grammar, **3627–8, 3174, 1494.**
**Vercingetorix** (*vĕr-sĭn-jĕt'ō-rĭks*) (d. 45? B.C.), chief of the Arverni in Gaul, leader of the great rebellion against Caesar; beheaded by Caesar's order; **564.**
**Verde** (*vĕrd*), **Cape,** westernmost point of Africa, **32.**
**Verden** (*fĕr'dĕn*), town of Hanover, Prussia, 21 mi. s.e. of Bremen on Aller R.; pop. 11,000; Saxons executed by Charlemagne, **690.**
**Verdi** (*vĕr'dē*), **Giuseppe** (1813–1901), Ital. composer, **3628;** 'Aïda', **3384.**
**Ver'digris.** A green pigment known to the anc. Romans and produced largely in the wine districts of France; it is made by the action of acetic acid on copper plates; it is used in paints, especially with white lead, in dyeing and calico printing, and as a medicine in the form of liniment.
**Verdun** (*vĕr-dŭn'*), France, fortified city in n.; pop. 20,000; in World War, **3628–9, 3794, 3810,** *picture,* **1353.**
**Verdun, Partition of** (843 A.D.), **3629, 1446.**
**Vereeniging** (*fĕr-ā'nī-gĭng*), **Peace of** (1902), **3527.**
**Vérendrye,** family name of two Fr. Canadian explorers, sons of a fur trader; first white men known to have visited North Dakota; founded Winnipeg; reached Rockies, **617.**
**Vereshtchagin** (*vĕr-ĕs-chä'gĭn*), **Vasili** (1842–1904), Rus. painter; by pictures of horrors of war sought to promote peace; **3250.**
**Vergil** (Publius Vergilius Maro) (70–19 B.C.), Rom. poet, **3630, 1967,** *picture,* **3041;** in Dante's 'Divine Comedy', **960;** 'Story of the Wooden Horse', **3543–4.**
**Verhaeren** (*vĕr-hä'rĕn*). **Emile** (1855–1916). Belgian poet and critic; in his early work applied pictorial method to psychological studies; later poems marked by patriotic fervor and by attempt to individualize towns and fields of Belgium ('Les Flamandes'; 'Les Débâcles'; 'Villages Illusoires'; 'Les Aubes').
**Verlaine', Paul** (1844–96). Fr. lyric poet, whose verse is the sincere expression of his ever-varying emotions and of his delight in the fine shades of sensation ('Poèmes saturniens'; 'Sagesse', a collection of religious poems; 'Amour'; 'Bonheur').
**Ver Meer** (*vĕr mār'*). **Jan** (1632–75), Dutch genre and landscape painter; for nearly 2 centuries forgotten, now acclaimed for the brilliant style of his early manner as well as the refined delicacy of later years ('View of Delft'; 'Diana at Her Toilet'; 'Street Scene in Delft'; 'Mary and Martha'); **2631.**
**Ver'mes,** the "worm" division of the animal kingdom, **3813, 3814, 127, 3944.**
**Vermicel'li, 2093.**
**Vermiform appendix.** *See in Index* **Appendix, vermiform.**
**Vermil'ion,** S.D., trade center on Missouri R. 35 mi. n.w. of Sioux City, Iowa; pop. 2600; state univ., *picture,* **3295.**
**Vermilion,** sulphide of mercury, **2200.**
**Vermilion Range,** Minn., **2254.**
**Vermont',** a New England state of the U.S.; 9564 sq. mi.; pop. 352,428; cap. Montpelier; **3630–3;** agriculture and forestry, **3632,** *map,* **2454;** history, **3630, 98, 2456;** marble and granite, **3632–3, 2945,** *pictures,* **3632, 2944;** meaning of name, **3630;** state flower, **3347;** surface, **3632.**
**Vermont, University of,** at Burlington, Vt.; co-ed., state control; founded 1791; arts and science, agriculture, engineering, medicine; *picture,* **3631.**
**Vernal equinox, 1173,** *picture,* **1063;** determines date of Easter, **1070.**
**Verne** (*vĕrn*), **Jules** (1828–1905). Fr. novelist, specializing in the romance of semi-scientific extravaganza ('Twenty Thousand Leagues under the Sea'; 'Around the World in Eighty Days').
**Vernon, Dorothy** (16th cent.). Daughter and heiress of Sir George Vernon; eloped with Sir John Manners and became ancestress of dukes of Rutland; heroine of Charles Major's novel, 'Dorothy Vernon of Haddon Hall'.
**Vernon, Edward** (1684–1757), Eng. admiral; captured (1739) Porto Bello, Panama, with a fleet of 6 ships; Mt. Vernon named for him, **3674.**
**Verona** (*vā-rō'nȧ*), Italy, fortified city 62 mi. w. of Venice on Adige R.; pop. 87,000; noted art center in Middle Ages; famous art collections and Rom. remains; Congress of great European powers 1822; bombarded by Austrian aviators in World War; scene of 'Romeo and Juliet', **3058.**
**Veronese** (*vā-rō-nā'sā*). **Paul** (1528–88), last great painter of Venetian school; real name Paolo Cagliari; **2630, 1851;** 'Alexander and the Family of Darius', *picture,* **2641.**
**Veronica** (*vĕ-rŏn'ĭ-kȧ*). **Saint.** Legendary woman of Jerusalem, on whose kerchief, used by Jesus to wipe the bloody sweat from his brow on way to Golgotha, his portrait was said to have been miraculously imprinted.

**Verrazano** (*vĕr-rä-tsä'nō*), **Giovanni** (1480?–1527?), Ital. explorer of New World in Fr. service, **109,** *map,* **110;** enters New York harbor, **2486.**
**Verrocchio** (*vĕr-rōk'kē-ō*), **Andrea del** (1435–88), Ital. sculptor, goldsmith, and painter, one of greatest early Renaissance artists, **3158, 2629;** statue of Colleoni, **1853,** *picture,* **1204;** teacher of Leonardo da Vinci, **3644.**
**Versailles** (*vĕr-sälz',* Fr. *vĕr-sä'y'*), France, suburb of Paris; pop. 60,000; **3633;** court of Louis XIV, **2066, 825.**
**Versailles, Treaty of** (1782), **3633, 3004.**
**Versailles, Treaty of** (1919), **3808, 3811;** covenant of League of Nations, **1974;** provisions affecting France, **1353–4;** Germany, **1444,** *map,* **1440;** Poland, **2856;** rejected by U.S., **3812, 3749, 1580.** *See also in Index* **Peace Conference.**
**Verse.** *See in Index* **Poetry.**
**Vers libre,** or free verse, **2851.**
**Vert,** in heraldry, **1639.**
**Ver'tebrae,** the segments of the backbone, **3245,** *picture,* **2437.**
**Ver'tebrates,** the backboned animals, **3634, 127,** *Study Outline,* **3947–52;** evolution, **130, 1277, 2997, 1209;** evolutionary position, *diagram,* **128;** first appear on earth, **1418;** variations in skeleton, **3244,** *pictures,* **3245.** For subordinate groups *see in Index* **Birds; Fish; Mammals; Reptiles.**
**Verviers** (*vĕr-vyā'*), Belgium. Town 15 mi. s.e. of Liége; pop. 45,000; woolen goods, dyes, glass; suffered severely during Ger. occupation 1914–18.
**Vesa'lius, Andreas** (1514–64). Belgian anatomist, **121, 3841, 2995.**
**Vesle** (*vĕl*), r. of n.e. France; rises n. of Châlons-sur-Marne, flows 80 mi. past Reims to Aisne 7 mi. s.e. of Soissons; in World War, **3806.**
**Ves'pa,** a genus of wasps and hornets, **3693.**
**Vespasian** (*vĕs-pā'zhĭ-ăn*) (Titus Flavius Vespasianus) (9–79 A.D.), Rom. emperor, father of Titus and Domitian; in his reign Titus captured and destroyed Jerusalem, the Colosseum was begun, and Agricola extended Rom. sway in Britain; **3047.**
**Vespers, 2299, 2300.**
**Vespers, Sicilian, 3230.**
**Vesper sparrow, 3308;** called black-throated bunting, **534;** care of young, **408.**
**Ves'pidae,** a family of wasps, **3693.**
**Vespucius** (*vĕs-pū'shŭs*), **Americus** (1451–1512), Florentine navigator for whom America was named, **3634, 3289,** *map,* **110;** memorials in Florence, **1293, 1849.**
**Ves'ta,** in Rom. myth., goddess of the hearth, **3634–5;** temple, **3058.**
**Vesta,** an asteroid, **237.**
**Vesta,** a wax match, **2170.**
**Vestal Virgins, 3634–5.**
**Vestig'ial structures,** in human body, **1209.**
**Vesu'vius, Mt., 3635–6, 3657;** buries Pompeii, **2875–8.**
**Veta Madre** (*vā'tà mä'drā*) **silver mine,** Guanajato, Mexico, **2210.**
**Vetches,** various bean-like plants including loco weed, **3712.**
**Ve'to, 3636;** Brit. crown, **2689;** Brit. House of Lords, **2688;** Cleveland's use of, **790;** governors (U.S.), **3346;** Jackson's use of, **1857;** Polish nobles, **2859.**
**Vevey** (*vĕ-vā'*), Switzerland, town on L. Geneva; tourist resort; pop. 13,000; industries, **3416.**
**Vézelay** (*vāz-lā'*), France. Village 60 mi. n.w. of Dijon; noted for the Madeleine (12th cent.), one of largest and most beautiful basilicas in France.
**Vézère** (*vā-zĕr'*) **River,** in s. France; flows 120 mi. to the Dordogne; prehistoric remains, **666.**
**Vi'a Sala'ria** ("salt road"), old road in Italy, **3115.**
**Viaud** (*vyō*), **Louis Marie Julien.** *See in Index* **Loti, Pierre.**
**Vibra'tion,** cause of light, **3311–4;** effect on bridges, **506;** sound, **3276–8.** *See also in Index* **Wave-motion.**
**Vi'broplex,** a telegraph transmitter, *picture,* **3457.**
**Vic'ar of Christ, 2664.**
**'Vicar of Wakefield',** novel by Goldsmith, **1484, 1483.**
**Vice-admiral,** of U.S. Navy, **2426;** grade created for Farragut, **1224;** insignia, *picture,* **3577.**
**Vicenza** (*vē-chĕn'tsä*), Italy. Town on Bacchiglione R. 40 mi. w. of Venice; pop. 57,000; produces silk, silk goods; birthplace of Palladio, great 16th cent. architect.
**Vice-president,** U.S., **3636–7;** list, **3636;** in cabinet, **555.**
**Vice'roy of India, 1754.**
**Vichy** (*vē-shē'*). Town in cent. France on the Allier R., famous for mineral springs.
**Vickers-Maxim machine gun, 2097.**
**Vicks'burg,** Miss., mfg. and cotton trading city on Mississippi R.; pop. 18,072; scene of decisive battle in Civil War; **3637, 2264, 2266.**
**Vicksburg, battle of** (1863), **3637, 1498, 2884.**
**'Vicomte de Bragelonne',** novel by Dumas, **1047.**
**Vic'tor, Saint,** Christian martyr, **2154.**
**Victor Emman'uel II** (1820–78), king of Italy, **3638, 1837, 1838;** and Cavour, **670;** and Garibaldi, **1399,** *picture,* **1837.**
**Victor Emmanuel III** (born 1869), king of Italy, **3638.**
**Victo'ria** (1819–1901), queen of Gt. Brit. and Ireland, **3639–40;** chief events of reign, **1661;** Disraeli's ministries, **1013;** Gladstone, **1468;** literature, **1167.**
**Victoria,** Australia, state in s.e.; 88,000 sq. mi.; pop. 1,500,000; **3638,** *map,* **264–5;** cap. Melbourne, **2194–5.**
**Victoria,** British Columbia, cap. and commercial center of province; at s.e. end of Vancouver Isl.; pop. 60,000; **3638–9,** *picture,* **512;** observatory, **2552.**
**Victoria** or **Hongkong,** China, **1678–9.**
**Victoria, Mt.,** Canada, in s.w. British Columbia, overlooking Lake Louise; height 11,500 ft.; *picture,* **600.**
**Victoria Alexandra, Princess** (born 1868), **1089.**
**Victoria Cross,** Brit. decoration, **978,** *picture,* **977.**
**Victoria Falls,** world's greatest cataract; in Zambezi R., Rhodesia: **3640–1.**
**Victoria Island,** Canada, large isl. in Arctic Ocean n. of provisional dist. of Mackenzie; *map,* **602–3.**
**Victoria Land,** Antarctica. *See in Index* **South Victoria Land.**
**Victorian Age,** in Eng. literature, **1167.**
**Victoria** or **Somerset Nile, 2510.**
**Victorian Order, 979.**
**Victoria Nyanza,** in e.-cent. Africa, 2d largest fresh-water lake in world; 26,000 sq. mi.; **3641, 36,** *map,* **1069.**
**Victoria regia,** a giant water-lily, **1546, 3699.**
**Victoria River.** Rises in the w. of Northern Territory, Australia, and flows n. and w. entering the Indian Ocean by a wide estuary called Queen's Channel.
**Victoria Tower,** Houses of Parliament, London, *picture,* **2049.**
**Victoria University,** at Toronto, Ontario; co-ed.; founded 1836 as a Meth. Episc. academy at Cobourg; affiliated with U. of Toronto 1892 and removed to present location; arts and theology; **3517.**
**Victoriaville,** Quebec. Mfg. town and farm center about 90 mi. n.e. of Montreal; pop. 4000; furniture, foundry and saw-mill products, maple syrup, wool.
**"Victor of the Marne," 1894.**
**'Victory',** Nelson's flagship, **2435.**
**Victory, Temple of Wingless,** *picture,* **250.**
**Victory Medal** (U.S.), **978,** *picture,* **977.**
**Vicuña** (*vē-kŭ'nyà*), a camel-like animal of S. Amer., **100, 591.**
**Vicuña cloth, 100.**
**Vienna** (*vē-ĕn'nà*), cap. of Austria on Danube R.; pop. 1,840,000; **3641–2;** twice besieged by Turks, **3559.**
**Vienna, Congress of, 3642, 1196;** Alexander I, **85;** Cracow a republic, **915;** diplomatic service, **1013;** Germany, **1448, 2929, 3132;** Netherlands independent, **2442;** Scandinavian countries, **3404, 997;** slave trade, **3249;** Swiss neutrality, **3415;** Talleyrand's influence, **3430.**
**Vienne** (*vē-ĕn'*), France. Anc. town on Rhone 17 mi. s. of Lyons; pop. 26,000; varied mfrs.; large trade; fortified by Caesar 47 B.C.; Rom. aqueducts; many antiquities.
**Viewfinder,** of camera, **591.**
**Vig'ils,** or evening devotions, **2300.**
**Vigny** (*vē-nyē'*), **Alfred de** (1797–1863). Fr. poet and dramatist; though he wrote relatively little, his fame is secure; some of his most famous poems ('Eloa'; 'Dolorida'; 'Moïse') antedated and tremendously influenced Hugo and the Romanticists; wrote 'Cinq Mars', a historical novel, famous in its day but now little read.
**Vijayanagar** (*vē'jà-nà-gär'*) or **Bijanagar.** Anc. Hindu kingdom of s. India 1336–1565; bulwark against Mohammedans; immense ruins of city of Vijayanagar preserved by Brit. govt.
**Vi'kings** (*vī'kĭngz* or *vē'kĭngz*) ("pirates"). *See in Index* **Northmen.**
**Vilayet** (*vē-lä-yĕt'*), Turkish governmental unit, **3559.**
**Villa** (*vē'yä*), **Francisco** or **"Pancho"** (born 1872), Mex. revolutionist and bandit; made peace 1920 with Mex. govt.; **2217.**
**Villa Concepcion.** Same as **Concepcion.**
**Villa Franca** (*vēl'lä frän'kä*), Azores, **288.**
**Villafranca,** Italy, town 10 mi. s.w. of Verona; pop. 12,000; preliminary treaty of peace ending war between France and Austria signed here (July 11, 1859), **1399, 3638.**
**Villa Rica** (*vēl'yä rē'kä*), city of Paraguay in agricultural region; pop. 26,000; large trade in tobacco and Paraguay tea; **2677.**
**Villars** (*vē-lär'*), **Claude Louis Hector, Duc de** (1653–1734). Marshal of France, one of greatest Fr. generals; commanded against Eugene and Marlborough in War of the Span. Succession.
**Vil'leins** or **serfs, 1236.**
**Villiers** (*vil'yērz*). **George.** *See in Index* **Buckingham, George Villiers.**
**Villon** (*vē-yôn'*). **François** (1431–?), greatest of Fr. medieval poets, a vagabond rascal, who escaped hanging only by great luck, **1364;** chief works, **1365.**
**Vilna** (*vēl'nà*) or **Wilna,** cap. of Lithuania, 170 mi. s. of Riga; pop. 215,000; formerly Rus. city captured by Germans in World War; r.r. center; extensive trade in grain and timber; **2030.**
**Vim'inal Hill,** Rome, **3056.**
**Vimy** (*vē-mē'*) **Ridge,** a high ridge 4 mi. n.e. of Arras; World War battles, **220, 3797, 3275, 941.**
**Vincennes** (*văn-sĕn'*), France, military town adjoining Paris on s.e.; pop. 35 000; celebrated castle begun 1164, now a fort, arsenal, and barracks; **2685, 2883.**
**Vincennes** (*vĭn-sĕnz'*), Ind., r.r. city on Wabash R. 55 mi. s.w. of Terre Haute; pop. 17,160; oldest town in state; flour, farm implements,

paper, glass; coal-mining interests; settled, **1762**; in Amer. Rev., **783, 3004.**

**Vincent, George Edgar** (born 1864). Amer. educator, b. Rockford, Ill.; taught at U. of Chicago 1892–1911 (dean 1900–11); pres. U. of Minnesota 1911–17; pres. Rockefeller Foundation after 1917.

**Vincent, John Heyl** (1832–1920), Amer. Meth. Episc. bishop, b. Tuscaloosa, Ala.; founder of Chautauqua system, **707.**

**Vincent de Paul** (*văn-sän' dē pōl*), **Saint** (1576–1660). Fr. priest, founder of the Sisters of Charity of St. Vincent de Paul and other orders devoted to "social service."

**Vinci** (*vin'chē*), **Leonardo da** (1452–1519), Ital. painter, **3643–4**; 'Mona Lisa', *picture*, **1203.**

**Vindava** (*vēn'dä-vä*). Same as **Windau.**

**Vindhya** (*vind'yä*), range in cent. India; highest point 5000 ft.; **1750.**

**Vindom'ina,** Celtic village on site of Vienna, **3642.**

**Vine, grape.** *See in Index* **Grapes.**

**Vin'egar, 3644, 302**; why sour, **10.**

**Vinegar eel,** a small worm, **3814.**

**Vinland** or **Wineland,** Norse name for N. Amer., **2526, 109.**

**Vi'ola.** Heroine of Shakespeare's 'Twelfth Night'; wrecked on coast of Illyria, in page disguise enters service of Duke Orsino, with whom she falls in love.

**Viola,** stringed musical instrument, **3646, 2383**; in orchestra, **2590.**

**Viola'ceae,** the violet family, **3942.**

**Vi'olet,** a flower, **3644–5**; in commercial gardening, **1396.**

**Violin',** stringed musical instrument, **3645–6, 2383,** *picture,* **2382**; in orchestra, **2590.**

**Viollet-le-Duc** (*vē-ô-lā'-lē-dük'*), **Eugène Emmanuel** (1814–79). Fr. architect, archeologist, critic, scientist, chief prophet of the Gothic revival in architecture, who revealed to the modern world the logic and beauty of the despised "barbarous" medieval construction.

**Violoncello** (*vē-ō-lŏn-chĕl'lō*), a musical instrument, **3646, 2383,** *picture,* **2382**; in orchestra, **2590.**

**Vionville** (*vē-ôn-vēl'*), **battle of.** *See in Index* **Mars-la-Tour.**

**Vi'pers,** various venomous snakes, **3646–7, 3259.**

**Virage,** in flying, *picture,* **61.**

**Virchow** (*fĕr'kō*), **Rudolph** (1821–1902). Ger. pathologist, anthropologist, and archeologist; established doctrine that disease is a phenomenon of the body cells primarily; directed notable improvements in sanitation of Berlin ('Cellular-pathologie').

**Vir'eo,** an olive-colored bird, **3647,** *pictures,* **419, 2411**; camouflaged nest, **406**; seasonal migration, **2231.**

**Vireon'idae,** vireo family, **412,** *picture,* **419.**

**Virgil.** Same as **Vergil.**

**Vir'gin,** a sign of the zodiac, **3840.**

**Virgin'ia.** Heroine of St. Pierre's romance 'Paul and Virginia', embodiment of innocence and naïveté.

**Virginia.** In Rom. legend, daughter of centurion Virginius, who killed her to prevent her falling into hands of Appius Claudius the decemvir (499 B.C.).

**Virginia,** a middle Atlantic state of U.S.; 42,627 sq. mi.; pop. 2,309,187; **3647–51,** *maps,* **3650, 3584–5**; agriculture, **3648, 3650**; cap. Richmond, **3018–9**; Chesapeake Bay, **716**; meaning of name, **3347, 2975**; minerals, **3650**; Norfolk, **2513**; Potomac R., **2902**; state flower, **3347.** —*History:* colonial period, chief events summarized, **1664**; Raleigh's expeditions, **2975**; Jamestown settled (1607), **1861, 3253**; first legislative assembly in America, **3603**; slavery introduced, **2434**; postal service established, **2896**; Bacon's Rebellion (1676), **301**; French and Indian War, **1362, 3676**; Revolutionary period, **1637–8, 975**; Jefferson's reforms, **1882**; Clark's conquest of the Northwest, **783**; Cornwallis' surrender at Yorktown, **3004**; first Sunday school in U.S., **3396**; struggle over federal constitution, **1638, 1982, 2107, 2155, 2306**; dispute with Kentucky, **1919–20**; nullification resolutions, **14, 3347, 2107**; John Brown's raid, **516**; secession from Union, **857, 3571**; W. Virginia separated, **3723**; battle of Bull Run, **533, 778**; Peninsular campaign, **778, 2095**; battle of Fredericksburg, **1361, 1571**; battle of Chancellorsville, **687, 1858, 1984**; battle of the Wilderness, **1984**; battle of Winchester, **3204–5**; fall of Richmond, **3019**; Lee's surrender, **1984.**

**Virginia,** Minn. Iron-mining and lumbering center 55 mi. n.w. of Duluth; pop. 14,022.

**'Virginia',** Confederate ironclad, **2287.**

**Virginia, University of,** at Charlottesville; state control; opened 1825; academic and graduate depts., schools of education, agriculture, engineering, law, medicine; established by Jefferson, **1882**; Madison bequeaths library to, **2108.**

**Virginia City,** Nev., mining center in s.w.; pop. 1200; Comstock lode, **2445, 3240, 3242.**

**Virginia creeper,** a creeping vine, **3651**; distinguished from poison ivy, **2852.**

**Virginia deer,** a white-tailed species, **980,** *picture,* **981.**

**Virginia Hot Springs, 3331.**

**Virginia juniper** or **red cedar, 1903.**

**"Virginia plan,"** U.S. Constitution, **2107.**

**Virginia rail,** a small marsh-dwelling bird, *picture,* **2961.**

**Virginia Resolutions, 14, 3347, 2107.**

**Virgin Islands,** W. Indies, 50 mi. e. of Porto Rico; owned by Gt. Brit. and U.S.; 190 sq. mi.; pop. 32,000; **3651,** *map,* **2514–5.**

**Virgin Mary, 1887–8, 2108.** *See also in Index* **Madonna.**

**Virgin's bower,** a clematis, **786.**

**Virgo** (*vĕr'gō*), a sign of the zodiac, **3840.**

**Visch'er, Peter** (1455?–1529), Ger. sculptor, **2543.**

**Vis'coloid, 673.**

**Visconti** (*vēs-kōn'tē*), celebrated Ital. family; ruled Milan 1277–1447; **2235.**

**Visconti, Gian Galeazzo** (d. 1402), ruler of Milan, **2235.**

**Vis'cose, 673.**

**Viscount** (*vī'kount*), British title of nobility, ranking between earl and baron, **2687.**

**Vishnu** (*vish'nu*), 2d of the Hindu supreme triad of gods, **1651, 486, 2108.**

**"Visible speech,"** system of teaching articulation to the deaf, **970.**

**Vis'igoths** or **West Goths, 1491, 1195**; defeat Romans at Adrianople, **26**; under Alaric, **73**; kingdom in Spain, **3303.**

**Vision.** *See in Index* **Eye.**

**Vis'tula River,** in cent. Europe, flowing 650 mi. to Baltic Sea, **3651,** *map,* **1440**; at Danzig, **962**; in Germany, **1439**; in Poland, **2856**; at Warsaw, **3673.**

**Vitaceae** (*vī-tā'sĕ-ē*), the grape family of plants, **3942.**

**Vital statistics,** birth and death, **2880–1**; kept by health department, **1614.** *See also in Index* **Population.**

**Vit'amins,** substances necessary in human diet, **3651–2, 1320**; in butter fat, **544**; nothing known of their digestion, **1011**; in rice, **3015.**

**'Vita Nuova'** (*vē'tä nu-ō'vä*) ("New Life"), work by Dante; prose interspersed with short poems; **958, 960.**

**Vitebsk** (*vē-tĕbsk'*). City in w. Russia, on Dvina R., 325 mi. s. of Petrograd; pop. 109,000; r.r. center; in flax-raising dist.; transit trade.

**Viterbo** (*vē-tĕr'bō*), Italy. Historic walled town 38 mi. n.w. of Rome; pop. 20,000; Gothic cathedral and churches with tombs of several popes; celebrated sulphur springs, Etruscan antiquities near by.

**Viti Levu** (*vē'tē lā'vu*), largest of Fiji Isls.; 4053 sq. mi.; **1239.**

**Vitoria** (*vē-tō'rē-ä*), Spain. City in n. center 32 mi. s.e. of Bilbao; pop. 34,000; varied mfrs.; decisive victory of Wellington 1813, freeing Spain from Fr. dominion.

**Vit'reous humor,** of the eye, **1214.**

**Vit'riol,** or oil of vitriol. Same as **Sulphuric acid.**

**Vitriol, blue,** copper sulphate, **3390.**

**Vitriol, green,** iron sulphate (copperas), **3390, 1779.**

**Viva voce** (*vī'vä vō'sē*) **voting, 321.**

**Viviani** (*vē-vyä-nē'*), **René** (born 1863). Fr. Socialist statesman, b. Algeria; premier (1914–15) on outbreak of World War; sat continuously in Chamber of Deputies after 1893 except 1902–06; frequently a cabinet officer and always a leader of the "left"; delegate to Limitation of Armament Conference at Washington, 1921–22.

**Vivip'arous animals,** those bearing living young, **1090**; among fish, **1275**; insects, **1786, 154**; among reptiles, **3261, 2038.**

**Vlaardingen** (*vlär'dĭng-ĕn*), Holland. Old town and river port on Maas, 6 mi. w. of Rotterdam; pop. 25,000; center of Dutch herring and cod fisheries.

**Vlachs** (*vlăks*), a Latin race widely scattered through s.e. Europe, n. and s. of the Danube from Bug R. to Adriatic; in Greece, **1528**; Macedonia, **2097**; in Rumania, **3082.**

**Vladimir** (*vlăd'i-mĭr*), **Saint** (d. 1015), "the Great," grand duke of Kief, first Christian sovereign of Russia; married a Byzantine princess and introduced Gk. Orthodox church; **1922.**

**Vladivostok** (*vlăd-ĭ-vŏs-tŏk'*), chief seaport of Siberia and terminus of Trans-Siberian R.R.; pop. 100,000; **3652–3**; occupied by Japan, **3812.**

**Vocal Memnon,** Egyptian statue, **2196,** *picture,* **1105.**

**Vocal organs, 3656–7**; of birds, **405, 915.**

**Vocational education, 3653–6, 3140–1**; accountancy, **7**; for blind, **437**; ceramic industries, **2905–6**; chemistry, **714**; crippled soldiers, **3653, 3656**; dentistry, **997–8**; engineering, **1149, 1150, 2251**; farming, **48**; home economics, **1675**; medicine and surgery, **2193**; mining, **2251**; nursing, **2544**; types of schools, **3655–6.**

**Vocational training, 3654, 3141.**

**Vod'ka,** Rus. beverage, usually made from potatoes, corn, and rye malt, **3088.**

**Vogelweide, Walther von der.** *See in Index* **Walther von der Vogelweide.**

**Voice, 3656–7**; change in adolescence, **25**; range of, **3278.**

**Voice,** of verb, **3627–8.**

**Voile** (*voil*), a fabric, **904.**

**Volapük** (*vō-lä-pük'*), a universal language, **1177.**

**Volcan'ic islands, 2622, 3658.**

**Volcanic soil, 679, 680, 1725, 3588.**

**Volca'noes, 3657–60,** *picture,* **2789**; in Alaska, **77**; Andes, **3284**; in Cent. Amer., **679–80, 2504, 3119**; cause earthquakes, **1065**; in E. Indies, **1072**; Etna, **1185**; Fujiyama, **1863,** *picture,* **1866**; Hawaiian Isls., **1601, 1602, 1604**; Iceland, **1723**; Kirunga in Africa, **36**; of Kamchatka, **1907**; lava, **1971–2**; of Mediterranean isls., **2194**; Mexico, **2209,** *picture,* **2212**; of moon, **2318, 2322**; Mt. Pelée, **2156**; period of greatest activity, **1422**; in Philippines, **2764–5**; S. Amer., **3284**; submarine volcanoes and tidal waves, **2623, 2792**; in U. S., **3231**; Vesuvius, **3635–6.**

**Vole,** a field mouse, **2359;** altitude range, *picture,* **397.**
**Vol'ga River,** in Russia, greatest r. of Europe, **3660, 3085, 1188,** *maps,* **1196–7, 1190–1;** caviar, **3086.**
**Volkhof** (*vŏl'кŏf*) **River,** in n.w. Russia; issues from L. Ilmen near Novgorod, flows n.e. 130 mi. to L. Ladoga; **3085, 3089.**
**Volscians** (*vŏl'shănz*), anc. Italic tribe; inhabited dist. s. of Latium; Romans war against, **3044.**
**Volsungs** (*vŏl'sụngz*). In Norse myth., heroic race descended from Odin, from which sprang Sigurd; story told in the 'Volsunga Saga' and William Morris' 'Story of Sigurd the Volsung'.
**Volt** (*vōlt*), the unit of electric potential (pressure); named for Alessandro Volta; **1116, 1110.**
**Volta** (*vōl'tä*), **Alessandro** (1745–1827), Ital. physicist, *picture,* **1121;** invented voltaic cell, **1120, 1112–3.**
**Volt'age,** "pressure" of an electric charge or current; measured in volts, **1110;** raised and lowered by transformers, **3523–4;** of street railway lines, **3371.**
**Volta'ic cell,** device for producing electric current chemically, **1113,** *picture,* **1109;** invention, **1120–1.**
**Voltaire** (*vōl-têr'*) **(François Marie Arouet)** (1694–1778), Fr. philosopher and writer, **3660–1, 1365,** *picture,* **1364;** and Frederick the Great, **1360;** characterizes Holy Rom. Empire, **1674;** influence, **1367, 1436.**
**Volterra** (*vōl-tĕr'rä*) (anc. Volaterrae), Italy. Thirty mi. s.w. of Florence; pop. 17,000; alabaster objects, salt, chemicals; once powerful Etruscan city; Etruscan antiquities.
**Volt'meter, 1392.**
**Volturno** (*vōl-tụr'nō*), r. in s. Italy, rises on w. slope of Apennines; flows s.w. 100 mi. to Tyrrhenian Sea; *map,* **1836.**
**Volume,** a book, origin of word, **455.**
**Volume,** of gases (Boyle's law), **1403;** in geometry, **1425;** units of measure, **3715.**
**Voluntary muscles, 2372–3.**
**Volunteers of America,** a religious and philanthropic organization, **3120.**
**Volvoca'les,** a group of unicellular plants, **3937;** often considered animals. *See in Index* **Phytoflagellata.**
**Vol'vox,** a greenish fresh-water organism, composed of similar cells gathered into a spherical colony; sphere rotates incessantly; classified as animal, **3944;** as plant, **3937;** evolutionary position, **128.**
**Voodoo** (*vụ'dụ*), **2118, 2120, 1561.**
**Vorarlberg** (*fōr'ärl-bêrк*), Austria, province in w. corner adjoining Germany and Switzerland; 1003 sq. mi.; pop. 134,000; Alpine region: pastoral region; makes cotton fabrics; **269, 1442.**
**Vosges** (*vōzh*) **Mts.,** of e. France, **3662, 1346,** *map,* **1351;** in Alsace-Lorraine, **102, 103.**
**Voting.** *See in Index* **Elections.**
**Voting machine, 321.**
**Voussoir** (*vụ-swär'*), of arch, *picture,* **174.**
**Vrille,** in flying, *picture,* **61.**
**Vulcan** (*vŭl'kăn*), in Rom. myth., god of fire and metal-working; identified with Gk. Hephaestus, **1639.** *See also in Index* **Hephaestus.**
**Vulcanism,** volcanic activity, **2788, 3657–60.**
**Vulcanizing, 3072, 3075–6.**
**Vul'gate,** Latin Bible, **389.**
**Vul'pes,** the fox genus, **1337.**
**Vulture,** a large carrion-eating bird, **3662,** *pictures,* **410;** buzzards, **551,** *picture,* **415;** condor, **856–7;** related to secretary bird, **3171.**

# W

THE twenty-third letter of the English alphabet is formed of two V's, but we call it "double u." The stories of U and V help you to see why this is so. The letter was originally written UU or VV in the days when U and V were forms of the same letter. But in this case the VV form, which became **W** when the letters were crossed, was the one that survived. In sound, however, it has remained the same, having the consonant value of *u*. It is uttered with the lips in position for *u* (*oo* of *pool*) but without the resonance of a full-fledged vowel. It has been suggested that it should have been called "half u" instead of "double u."

**Waal** (*väl*), r. in Netherlands, the southern arm of Rhine, **2207,** *map,* **373.**

**Wabash** (*wą'băsh*), Ind. Industrial city on Wabash R. 80 mi. n. of Indianapolis; pop. 9872; motor trucks, flour, lumber products.

**Wabash and Erie Canal, 2568.**

**Wabash College.** At Crawfordsville, Ind.; men; founded 1832 by Presbyterians; liberal arts.

**Wabash River,** tributary of Ohio R. rising in w. Ohio and forming part of Ill.–Ind. boundary; 550 mi. long; **1757, 1758, 1759.**

**'Wacht am Rhein, Die',** Ger. national song, **2405.**

**Waco** (*wā'kō*), Tex., mfg. city in center, 85 mi. s. of Dallas; pop. 38,500; trade center for cotton, grain, and cattle dist.; cotton products, men's clothing, wagons; Baylor Univ.; **3477.**

**Wade, Benjamin Franklin** (1800–78), Amer. statesman, b. W. Springfield, Mass.; U.S. senator from Ohio 1851–69; anti-slavery leader; attitude on reconstruction, **1897.**

**Wadham College,** Oxford, founded, **2610.**

**Wadi** (*wäd'ĭ*) or **wady,** dry river bed, **3104.**

**Wading birds.** *See in Index* **Herodiones.**

**Wady Halfa** (*wä'dī häl'fä*), town on Nile R. 150 mi. below Assuan, **1093, 1094.**

**Wages, 1076, 1077, 1078, 433;** in factories, **1218;** work of labor organizations, **1947.**

**Wagner** (*vä̆g-nêr'*), **Charles** (1852–1918). Fr. pastor and author ('The Simple Life').

**Wagner** (*vä̆g'nēr*), **Cosima** (1841–1918). Daughter of Liszt and 2d wife of Richard Wagner, directing spirit of Bayreuth Theater after Wagner's death.

**Wagner, Wilhelm Richard** (1813–83), Ger. composer, creator of the modern music-drama, **3663, 2380, 2584,** *pictures,* **3663, 2379;** on Beethoven, **366;** and Liszt, **2026;** 'Lohengrin', **2047;** 'Siegfried', **3230–1;** 'Tannhäuser', **3433.**

**Wagram** (*vä'grăm*), Austria, village 12 mi. n.e. of Vienna; battle (1809), **2396.**

**Wagtail,** small bird with long tail which jerks incessantly, **3505, 412.**

**Wahpeton** (*wą'pē-tŏn*), N.D., city in s.e.; pop. 3069; flax fiber works, flour mills; **2525.**

**Waiblingen** (*vī'bling-ĕn*), Germany, town in Württemberg; pop. 7000; **1546.**

**Wailing Place,** Jerusalem, **1885,** *picture.* **1886.**

**Wakefield,** England, mfg. town of Yorkshire, on Calder R. 9 mi. s. of Leeds; pop. 51,000; battle (1460), **3068, 1088.**

**Wakefield,** Mass. Town 9 mi. n. of Boston; pop. 13,025; clothing, shoes, iron and brass products, pianos.

**Wake Forest College.** At Wake Forest, N.C.; men, Bapt.; established 1833; arts and science, law, medicine.

**Wake-robin,** a trillium, **3540–1.**

**Walcheren** (*väl'kĕr-ĕn*), westernmost isl. of Netherlands, in province of Zealand; costume, *picture,* **2439.**

**Waldeck** (*väl'dĕk*). Republic of w. Germany, formerly principality; 433 sq. mi.; pop. 67,000.

**Waldeck-Rousseau** (*väl-dĕk'-rų-sō'*), **Pierre Marie** (1846–1904). Fr. statesman, premier 1899–1902.

**'Walden',** book by Thoreau, **3492.**

**Waldenses** (*wąl-dĕn'sēz*) or **Vaudois,** religious sect living in Fr. Alps; founded 12th cent. by Peter Waldo, rich merchant of Lyons; massacre of, **1354.**

**Waldseemüller** (*vält'zā-mül-ēr*), **Martin** (1470?–1521), Ger. geographer who fastened name of 'America' to the New World, **3634.**

**Wales** (*wālz*), an historical division of Gt. Brit. occupying w.-cent. peninsula of isl.; 7466 sq. mi.; pop. more than 2,000,000; **3664–5,** *maps,* **1159, 1152–3, 1196–7;** Celts in, **674;** emigration to U.S., **2718;** language, **1162;** monasticism, **2299.**

**Wales, Prince of, 3664, 1087.**

**Walfisch Bay,** harbor off coast of s.w. Africa, belonging to Gt. Brit.; rainfall, **2972.**

**Walham Green,** London, **2056.**

**Walker, Francis Amasa** (1840–97). Amer. political economist, b. Boston; combated "wage-fund" theory ('The Wage Question'); son of Amasa Walker, author of 'The Science of Wealth'.

**Walker, Nellie Verne** (born 1874), Amer. sculptor, b. Red Oak, Iowa; 'Her Son', frontispiece, Vol. 7.

**Walker, Robert James** (1801–69). Amer. statesman, b. Northumberland, Pa.; sec. of treasury under Polk, author of "Walker tariff bill" of 1846, providing for revenue only.

**Walker, William** (1824–60), Amer. filibusterer, b. Nashville, Tenn.; gained control in Nicaragua; executed by Hondurans on his expedition there; conquers Costa Rica, **896.**

**Walking leaf insect, 1784,** *picture,* **1785;** belongs to grasshopper order, **3946.**

**Walking stick,** a long, slender insect, *picture,* **2925;** belongs to grasshopper order, **3946;** egg, *picture,* **1091.**

**"Walking the plank," 1921.**

**Wal'laby,** a small kangaroo, **1908.**

**Wallace, Alfred Russel** (1823–1913), Eng. traveler and naturalist, co-discoverer with Darwin of natural selection theory of evolution, **964.** *See in Index* **Wallace's Line.**

**Wallace, Henry Cantwell** (born 1866). Amer. editor, sec. of agriculture under Harding; b. Rock Island, Ill.

**Wallace, Lewis** (1827–1905), Amer. Civil War general and author ('Ben Hur'; 'The Fair God'), **1762.**

**Wallace, Sir William** (1270?–1305), Scotch hero, **3667, 3148, 1088.**

**Wallace's Line,** imaginary line dividing regions of Australian and Asiatic life, first traced by Alfred Russel Wallace, **228, 404, 1070, 1072,** *map,* **1072–3.**

**Wallachia** (*wà-lā'kĭ-à*), dist. of w. Rumania; 30,000 sq. mi.; pop. 3,299,000; once a principality; becomes autonomous, **3080, 523, 1661.**

**Wal'lasey,** England. Mfg. town on Mersey estuary, 4 mi. n.w. of Liverpool; pop. 100,000; practically a suburb of Birkenhead; has immense dock formed from Wallasey Pool, former marsh.

**Walla Walla,** Wash. In s.e. near Oregon border, trade center for wheat, vegetable, and fruit-growing and stock-raising region; pop. 15,503; flour, smoked meats, steel and iron products; Whitman College; Ft. Walla Walla.

**Wallenstein** (*väl'ĕn-shtīn*), **Albrecht Wenzel Eusebius von, Duke of Friedland** (1583–1634), Ger. general, b. Bohemia; commanded imperial army in Thirty Years' War until 1630; recalled to command after Tilly's death; suspected of treason; assassinated; subject of drama by Schiller; **3488, 1554.**

**Wallingford,** Conn. Town on Quinnipiac R., 12 mi. n. of New Haven; pop. 9648; sterling silver, silver plate, nickel, brass goods, ironware.

**Wallingford, Treaty of** (1153), **3352.**

**Wallis, Samuel** (1728–95). Brit. navigator who discovered Tahiti and other Pacific isls. on voyage around the globe 1766–68.

**Wallis Islands** or **Uvea,** group n.e. of Fiji; 40 sq. mi.; **2624.**

**Walloons',** a people of Belgium, **376, 1995.**

**Wall painting, 2629.**

**Wall paper, 3665–7.**

**Wall Street,** New York City, financial center of U.S., **3359–60, 2490,** *picture,* **2492.**

**Walnut, 3667–8, 2545;** butternut, **548;** California production, **582;** classified, **3533;** food value, **1321;** hulls contain tannin, **3173.**

**Walnut family,** the *Juglandaceae,* **2545, 3940.**

**Walpi,** a village of Hopi Indians in n.-cent. Arizona, *picture,* **2463.**

**Wal'pole, Horace** (1717–97), 4th **Earl of Orford.** Eng. author and wit, called best of Eng. letter-writers; son of Sir Robert Walpole; his 'Castle of Otranto', a mystery tale, initiated romantic movement.

**Walpole, Hugh** (born 1884). Eng. novelist ('The Prelude to Adventure'; 'The Dark Forest').

**Walpole, Sir Robert** (1676–1745), first **Earl of Orford,** first Eng. prime minister, **1428, 2869.**

**Walpurgis** (*väl-pur'gēs*) or **Walburga, Saint** (754?–799?). Eng. nun, missionary to Germany, regarded as protectress against witchcraft; hence May-Day eve, the time of witches' carnival according to Ger. legend, is called Walpurgis night.
**Walrus,** a marine seal-like animal, **3668.**
**Walsall** (*wąl'sąl*), England. Mfg. town 8 mi. n.w. of Birmingham; pop. 97,000; leather goods, spirits, iron and brass products.
**Wal'singham, Sir Francis** (1530?–90). Eng. statesman and diplomat. sec. of state under Elizabeth; maintained army of spies in foreign courts; exposed Babington plot and influenced Elizabeth to sign Mary Stuart's death warrant.
**Walter, Eugene** (born 1874), Amer. playwright, b. Cleveland, Ohio; chief plays, **1038.**
**Walter the Penniless,** Fr. knight, leader of early Crusade, **929.**
**Wal'tham,** Mass., city 10 mi. n.w. of Boston, on Charles R.; pop. 30,915; **472, 2166, 2168.**
**Waltham Abbey** or **Waltham Holy Cross,** England. Market town on R. Lea, 12 mi. n. of London; name from abbey founded by King Harold; govt. rifle factory.
**Walther von der Vogelweide** (*väl'tĕr fȯn dĕr fō'gĕl-vī-dē*) (1170?–1220?), Ger. minnesinger, one of greatest Ger. lyric poets; chief works, **1438.**
**Walton, Izaak** (1593–1683), Eng. writer, author of 'The Compleat Angler', a quaint delightful embodiment of the pleasures of outdoor life, **1165, 3370.**
**Wampano'ags,** a powerful Indian tribe of Algonquian stock, formerly occupying the whole of s. Massachusetts; treaty with Pilgrims, **2841;** King Philip's War, **1772.**
**Wam'pum,** shells used by N. Amer. Indians as money, **3202, 2281, 1768.**
**Wan'amaker, John** (born 1838), Amer. merchant, one of first to employ expensive advertising to build enormous dept. store; U.S. postmaster-general 1889–93; **1592.**
**Wandering Jew,** legendary character (sometimes called Ahasuerus), **3668–9.**
**Wandering Jew,** a plant, **3669.**
**Wapiti** (*wąp'i-ti*), a deer, **3669;** miscalled elk, **980.**
**Wapta, Mt.,** British Columbia, *picture,* **511.**
**War.** *See in Index* **Warfare.**
**War, Department of,** U.S., **3597, 3598–9, 217–8;** secretary, **555.**
**War'beck, Perkin** (1474–99). Eng. pretender, claimed to be Richard, younger of the two princes murdered by Richard III; started several unsuccessful revolts, captured, and executed by order of Henry VII.
**Warbler,** a small insect-eating bird, **3669,** *picture,* **420;** migrations, **2231;** outwits cowbird, *picture,* **404;** nest, **406;** nightingale, a European warbler, **2509.**
**Ward, Artemas** (1727–1800). Amer. Rev. general and jurist, b. Shrewsbury, Mass.; conducted siege of Boston until arrival of Washington; later chief justice Court of Common Pleas at Worcester, Mass., pres. of Massachusetts executive council, member of legislature and of House of Representatives.
**Ward, Artemus.** Pen name of Charles Farrar Browne (1834–67), Amer. humorist, b. Waterford, Me. ('Artemus Ward: His Book'—one of enormously popular series, funny through atrocious spelling and absurdity).
**Ward, Elizabeth Stuart Phelps.** *See in Index* **Phelps.**
**Ward, Frederick Townsend** (1831–62), Amer. military adventurer, b. Salem, Mass.; saved Shantung from capture by Taiping rebels, became Chinese mandarin, and organized force which became nucleus of Gordon's "Ever-Victorious Army"; **749.**
**Ward, Mrs. Humphry** (Mary Augusta Arnold) (1851–1920). Eng. novelist, daughter of Arnold of Rugby ('Robert Elsmere', problem novel of the "battle of belief" became "talk of the civilized world" through review of Gladstone; 'Marcella'; 'Lady Rose's Daughter').
**Ward, John Quincy Adams** (1830–1910), Amer. sculptor, b. Urbana, Ohio ('Indian Hunter', Central Park, New York City; 'General Thomas', Washington, D.C.; 'George Washington', Sub-Treasury, New York City), **3164.**
**Ward, Lester F.** (1841–1913). Geologist, philosopher, and distinguished Amer. sociologist, b. Joliet, Ill.; opposed Spencer's laissez-faire individualism ('Dynamic Sociology').
**Ward,** in city govt., **2370.**
**"Warden of the North," 1565.**
**Wards Island,** N.Y., **2488.**
**Warehouse,** cold storage, **2990–2,** *picture,* **2989, 2991.**
**Warfare,** airplane, **54–63;** armistice, **213;** armor, **214–6;** balloons, **314–20;** barbed wire, **3758;** camouflage, **591;** cannon, **633–6;** courts-martial, **910;** poisonous gases, **1408;** laws of, **1794, 1559, 3791;** machine gun, **2097–2101;** martial law, **1972;** motor transport, **274–5;** navy, **2422–8;** opposed by socialists, **3269;** submarines, **3375–8;** tanks, **3433;** torpedoes and mines, **3517–20.**
*Development:* Assyrian soldiers, *picture,* **296;** Sumerian phalanx, **297;** in anc. Greece, **3486,** *picture,* **3485;** siege in Middle Ages, **654–6;** developed in Hundred Years' War, **1699–1700;** gunpowder introduced, **773, 1552;** artillery at battle of Ravenna (1512), **2979;** Gustavus Adolphus, **1553;** iron weapons introduced, **1106;** revolutionized in World War, **3790–1.** *See also in Index* **Army; Cannon; Firearms; Navy;** etc.
**War'field, David** (born 1866), Amer. actor, b. San Francisco ('The Auctioneer'; 'The Music Master'; 'The Return of Peter Grimm'), **1892.**
**"War Hawks"** of 1812, **3671, 575, 785.**
**War Mothers of America, 2695.**
**Warner, Charles Dudley** (1829–1900). Amer. essayist, humorist, and editor, b. Plainfield, Mass. ('My Summer in a Garden'; 'Backlog Studies').
**Warner, Olin L.** (1844–96), Amer. sculptor, b. W. Suffield, Conn. ('Memory' and 'Imagination' on bronze doors of Library of Congress; 'Twilight'), **3683.**
**Warner, Seth** (1743–84), Amer. Rev. soldier, b. Roxbury, Conn.; leader of "Green Mountain Boys"; captured Crown Point 1775; **3630.**
**War of 1812,** between Gt. Brit. and U.S., **3670–3;** causes and preliminary events, **3670–1, 1140, 1883;** Madison's administration of, **2108;** opposition to, **3672–3, 3347, 3604, 2108, 521;** precipitated by "War Hawks," **3671, 575, 785;** results, **3673, 3604;** uniforms, **3578.**
*Leaders and chief events,* **3672;** Baltimore attacked, **322;** *Constitution's* victories, **3672, 2423;** Decatur, **971;** Detroit surrendered, **2227, 1000;** Farragut, **1225;** Ft. Dearborn massacre, **725;** William H. Harrison, **1594;** Indians, **1772, 3452;** Jackson, **1856;** Lawrence, **1973;** Perry, **2730;** York burned **3517;** Washington burned, **3672, 3680.**
**War of 1812, Society of, 2695.**
**"War of Jenkins' Ear," 2046.**
**War of the Austrian Succession.** *See in Index* **Austrian Succession.**
**Warp,** in weaving, **3326, 3327, 904.**
**Warp knit fabrics, 1937.**
**Warrant.** A judicial writ ordering competent officers to make arrests, search houses, and seize property; warrant of arrest, search warrant, etc.
**Warren, John Collins** (1778–1856). Amer. surgeon, b. Boston, Mass., nephew of Gen. Joseph Warren; one of founders and long chief surgeon Massachusetts General Hospital, where in 1846 he performed first public operation on a patient under ether, Dr. Morton acting as anesthetist.
**Warren, Joseph** (1741–75), Amer. physician and patriot, b. Roxbury, Mass., most influential extreme Whig leader next to the Adamses; killed at Bunker Hill, becoming the "first great martyr in this great cause"; **534.**
**Warren,** Ohio. Mfg. city on Mahoning R. 50 mi. s.e. of Cleveland; pop. 27,050; automobiles, electrical supplies, tank cars, flour, lumber.
**Warren,** Pa. Borough on Allegheny R. 50 mi. s.e. of Erie; pop. 14,272; trade center; oil refineries, furniture factories, iron and steel works.
**Warrens,** of rabbits, *picture,* **1585.**
**Warrington,** England. Mfg. town 18 mi. e. of Liverpool on Mersey R.; pop. 78,000; varied iron products.
**War risk insurance, 1792.**
**Wars.** *See in Index* names of various wars; *also* list of world's great wars on following page.
**Warsaw,** N.Y., village and summer resort 38 mi. s.e. of **Buffalo; pop.** 3622; salt, **3115.**
**Warsaw,** Poland, cap. and largest city, on Vistula R.; pop. 980,000; **3673;** Kosciusko defends, **1944.**
**Warsaw, Grand Duchy of, 3673, 2859.**
**War-ships.** *See in Index* **Navy; Ships.**
**Wars of the Roses.** *See in Index* **Roses, Wars of the.**
**Wartburg** (*värt'burĸ*), 11th cent. castle near Eisenach, Saxe-Weimar, Germany; scene of minstrels' contest 1207, immortalized in Wagner's 'Tannhäuser'; Luther hides in, **2085.**
**Warthe** (*vär'tē*) **River,** chief tributary of Oder R.; rises n.w. of Cracow, Poland, flows n. and w. entering e. Germany, and joins Oder after course of 445 mi.; *map,* **1440.**
**Wart hog,** an African wild hog, *picture,* **1671;** altitude range, *picture,* **397.**
**Warton, Thomas** (1728–90), Eng. poet and historian of poetry ('The History of English Poetry'), **2848.**
**Warts, 3673–4;** cures for, **3674, 3839.**
**Warwick, Richard Neville, Earl of** (1428–71), Eng. statesman and soldier, called "The Kingmaker"; hero of Bulwer-Lytton's 'Last of the Barons', and appears in Shakespeare's 'Henry VI'; **3066, 3068, 1088.**
**Warwick,** England, cap. of Warwickshire on R. Avon; pop. 12,500; castle with many art treasures (vase from Hadrian's villa); Rom. station, later fortified by Ethelfleda (915); **1160.**
**Warwick,** R.I. Town, chiefly residential, 5 mi. s. of Providence, on Pawtuxet and Providence rivers and Narragansett Bay; extensive cotton mfrs. in W. Warwick, which was made separate town in 1912; pop. Warwick, 13,481; W. Warwick, 15,461.
**Warwickshire,** midland county of England; 902 sq. mi.; pop. 1,375,000; stock-raising, manufacturing (metal-working), quarrying, coal and iron mining; Shakespeare's country, **3189.**
**Wasatch** (*wą'săch*) **Mts.,** range of Rocky Mts. beginning in s.e. Idaho and running through Utah to s.w. corner; average height, 10,000 ft.; **3116, 3610.**
**Waseda University,** Japan, founded by Count Okuma, **3511.**

**Wash, The,** shallow bay of North Sea between counties of Lincoln and Norfolk, England, *map,* **1159.**
**Washburn College.** At Topeka, Kan.; co-ed.; at first Cong. but now non-sect.; chartered 1865 (as Lincoln College, renamed 1868); liberal arts, medicine, law, music, art, oratory.
**Washing soda,** sodium carbonate, **3271.**
**Washington, Augustine** (1694–1799), father of George Washington, **3674.**
**Washington, Booker Taliaferro** (1859?–1915), negro educator, **3674.**
**Washington, George** (1732–99), Amer. patriot and soldier, first president of U.S., **3674–80;** statues and monuments, **322, 3019, 3540, 3684,** *pictures,* **2055, 3161, 3685;** early life, **3674–5, 329;** home at Mt. Vernon, **2358–9;** in Fr. and Indian War, **3676, 1362;** in Rev. War, **3676–7, 3002–4, 975;** takes command of army, **3676, 588;** winter at Valley Forge, **3615;** "Conway Cabal," **1409;** and Lafayette, **1956;** and Benedict Arnold, **219;** organizes Society of the Cincinnati, **2695;** in Constitutional Convention, **3593, 3677.** —*Administrations,* **3677–8, 3604;** Adams vice-president, **13;** beginning of cabinet, **555;** canal building, **626;** Farewell Address, quotation from, **3601;** on "entangling alliances," **2305;** Hamilton sec. of treasury, **1569;** Jay chief justice, **1880;** Jefferson sec. of state, **1882;** Monroe minister to France, **2306;** Paine's attack, **2626;** site chosen for federal capital, **3680.** *See also in Index* **Revolution, American.**
**Washington, Lawrence** (1718–52), elder half-brother and counselor of George Washington, **3674.**
**Washington, Martha Dandridge Custis** (1732–1802), daughter of Col. John Dandridge and widow of Daniel Parke Custis; married George Washington (1759), **3676, 2106.**
**Washington,** a Pacific coast state of the U.S.; 69,127 sq. mi.; pop. 1,356,621; cap. Olympia; **3686–90,** *maps,* **3687, 3584–5;** climate and rainfall, **3686, 2973;** history, **3688, 3690;** irrigation, **3687, 1829,** *picture,* **1828;** Mt. Rainier National Park, **3687, 2400;** natural features, **3686–7;** origin of name, **3347;** resources and products, **3687–9;** spruce, **3333;** state flower, **3347.**
**Washington,** D.C., cap. of U.S.; pop. 437,571; **3680–6,** *map,* **2162;** capitol, **3680–2;** Gallaudet College for deaf, **970;** government, **3686;** history, **3680, 3677–8, 3672, 3685;** Lafayette monument, *picture,* **1956;** Library of Congress, **3682, 1992,** *picture,* **1993;** Lincoln Memorial, *picture,* **2011;** Naval Observatory, **2551;** Patent Office, **2692, 2694;** Treasury, *picture,* **2284;** White House, **3733–4.**
**Washington,** Pa. Borough 25 mi. s.w. of Pittsburgh in coal region; pop. 21,480; Mason glass jars, iron and steel products, tin-plate; Washington and Jefferson College and several preparatory schools.
**Washington, Mt.,** in New Hampshire, highest peak in New England (6293 ft.); meteorological station; **2453.**
**Washington, State College of.** Co-ed. state institution at Pullman, Wash.; chartered 1890; sciences, agriculture, home economics, engineering, military science, music and fine arts.
**Washington, Treaty of** (1871), **1499.**
**Washington, University of,** co-ed. state institution at Seattle, Wash.; founded 1861; arts and science,

## SOME OF THE GREAT WARS OF HISTORY

**American Revolution** (1775–83): Successful revolt of the Thirteen English Colonies in America against Brit. rule; Bunker Hill, Saratoga, Yorktown; independence recognized by Great Britain.

**Austrian Succession** (1741–48): Concerted action of continental powers to appropriate desirable pieces of Hapsburg lands from Maria Theresa, whose cause was championed by Gt. Brit.; war ended with mutual restoration of conquests, except Silesia, which was retained by Prussia.

**Austro-Prussian** (1866): "Seven Weeks' War," arising out of differences over Schleswig-Holstein question; resulted in overwhelming defeat of Austria at Sadowa, and subsequent exclusion from Ger. federation.

**Balkan Wars** (1912–13): Attempt of Balkan allies to expel Turkey from Europe; remarkable successes were minimized by subsequent quarrels between allies over newly won territory, enabling Turkey to retain her hold on Constantinople and surrounding territory.

**Boer War** (1899–1902): Spirited, but futile resistance of Boer settlers in S. Africa to extension of Brit. claims; Transvaal and Orange Free State made Brit. colonies.

**Chinese-Japanese War** (1894–95): Occasioned by rival pretensions in Korea; a complete victory of Japan's modern military machine over China's antiquated forces; Japan forced by European powers to restore all conquests except Formosa.

**Civil War in England** (1642–49): Struggle between the Crown and Puritan Parliament over distribution of ecclesiastical and civil jurisdiction; Marston Moor and Naseby; execution of Charles I and establishment of commonwealth.

**Civil War in the United States** (1861–65): Between Union government and Southern Confederacy over latter's attempt to secede from Union; Vicksburg, Gettysburg; Union preserved.

**Crimean** (1854–56): Undertaken by Gt. Brit. with aid of other powers in defense of Turkey against Rus. aggressions; siege of Sebastopol; Turkey left intact.

**Crusades** (1096–1291): Romantic military expeditions of western princes and prelates to recover Holy Sepulchre from Saracens; capture of Antioch, Jerusalem, and Acre; later Crusades were diverted to other ends and Holy Land lapsed into Mohammedan control.

**Dutch Independence** (1568–1648): Led by William of Orange; Dutch threw off oppressive Span. rule and established independent government; siege of Leyden.

**Franco-Prussian** (1870–71): Clash between Prussia's imperialistic aspirations and the jealousy of Napoleon III, resulting in humiliating defeat of France, downfall of the Second Empire, and proclamation of German Empire; Sedan, siege of Paris.

**French Revolution** (1792–99): Great Britain headed coalition of Prussia, Austria, and other countries against France in contest that was last phase of long wars between England and France for colonial and maritime supremacy and also clash between two political systems; Valmy, Ital. campaign; peace made with all allies except England; Egypt. expedition.

**Great Northern** (1700–21): Undertaken by Russia aided by Denmark and Poland to secure Baltic port at expense of Sweden; siege of Narva, Poltava; Russia secured provinces about Gulf of Finland and Sweden sank to second-rate power.

**Greek Independence** (1821–29): Greeks threw off Turkish yoke and revived national independence.

**Hundred Years'** (1337–1453): Series of conflicts between rulers of France and England over disputed titles to Fr. throne and territories; Crécy, Poitiers, Agincourt, Orléans; England lost Fr. possessions except Calais; Fr. monarchy firmly established.

**Mexican** (1846–48): Arose from annexation by the United States of former Mexican territory of Texas and ensuing boundary disputes; resulted in complete Amer. victory, establishment of the Rio Grande as the boundary, and cession of upper California and New Mexico to United States.

**Napoleonic** (1799–1815): Determined resistance of Allied European powers to aggressions of Napoleon, ending in his downfall; Austerlitz, Leipzig, Trafalgar, Waterloo.

**Peloponnesian** (431–404 B.C.): Between rival states of Athens and Sparta for economic and political control of Greece; Athenian expedition to Syracuse, Aegospotami; Athenian supremacy ended.

**Persian** (493–479 B.C.): Expeditions of Persian emperors against Greece to punish Athens for aiding revolting Persian colonies in Asia Minor, and to extend empire; Marathon, Thermopylae Salamis, Plataca; Greece maintained independence and control of Aegean.

**Punic Wars** (264–241, 218–202, 149–146 B.C.): Death struggle of Rome and Carthage for domination of Mediterranean world; Hannibal's invasion of Italy, Cannae, Zama, Metaurus; Carthage taken and destroyed.

**Russo-Japanese** (1904–05): Blow dealt by Japan to Rus. aggression in Far East; siege of Port Arthur, battle of the Sea of Japan; Japanese interests in Korea recognized as paramount, and Japan established as a first-rate power.

**Russo-Turkish** (1877–8): Arose indirectly from complicated Balkan situation, and directly from Mohammedan uprising against Balkan Christians; fall of Plevna; power of Turkey in Europe practically destroyed, only to be resuscitated by Congress of Berlin.

**Seven Years'** (1756–63): Resulted from alliance formed against rapidly expanding Prussia by Austria, Russia, France, and other powers; Gt. Brit. allied with Prussia; Rossbach, Leuthen, Quebec; Prussia established as great nation, and foundation of Brit. Empire laid.

**Spanish-American** (1898–99): Outcome of American sympathy for Cuban revolutionists; established Cuban independence and practically ended Spain's colonial empire, remnants of which were ceded to U.S.; Manila Bay and Santiago.

**Spanish Succession** (1701–14): Attempt of England, Austria, and allies to prevent establishment of a French prince on Span. throne; Blenheim; Bourbon House established in Spain, but Austria and England gained extensive Fr. and Span. possessions.

**Thirty Years'** (1618–48): Struggle between Catholics and Protestants of Germany in which Gustavus Adolphus of Sweden played a brilliant part; Leipzig, Lützen; religious and territorial differences settled at price of utter devastation of Germany.

**Trojan** (c. 1100 B.C.): Waged by Gk. princes against King Priam to avenge abduction of Helen, wife of Menelaus of Sparta (myth.); siege and fall of Troy.

**Wars of Alexander the Great** (334–323 B.C.): Persian Empire completely overthrown in battles of Granicus, Issus, and Arbela; conquest of Syria, Palestine, and Egypt; invasion of Media.

**Wars of the Roses** (1455–85): Waged by Houses of Lancaster and York, rival claimants to Eng. throne, until royal marriage united the two lines; Bosworth Field.

**War of 1812** (1812–14): Between United States and Great Britain, caused by Great Britain's claims to right of search of Amer. vessels on high seas and impressment of seamen; treaty adjusted boundaries, etc., leaving main cause of war unmentioned.

**World War** (1914–18): A world-wide struggle between Central Powers and Allied and Associated Powers, arising indirectly from clash between two rival systems of commercial imperialism, and directly from diplomatic tangle following murder of Archduke of Austria by a Serb; Central Powers crushed.

education, engineering, forestry, mines, law, graduate school; **3170,** *picture,* **3689.**
**Washington and Jefferson College.** At Washington, Pa.; non-sect., men; established 1865 by union of Washington College (chartered 1806) and Jefferson College (chartered 1802); classical, scientific, and civil engineering courses.
**Washington and Lee University,** non-sect. institution for men at Lexington, Va.; founded 1749 (chartered 1782); received donations from George Washington; arts, sciences, engineering, law; *picture,* **3649;** Lee president, **1984.**
**Washington College.** At Chestertown, Md.; co-ed., non-sect.; state appropriation; chartered 1782; classics, sciences.
**Washington Conference** (1921). Called to consider limitation of armaments; U.S., Brit. Empire, France, Italy, Japan, China, Belgium, Netherlands, and Portugal represented. Treaties signed: Five-Power (first five powers listed), limiting number and tonnage of capital ships in navies; Five-Power, regulating use of poison gas and submarines; two Four-Power (Italy omitted), pledging respect for rights of each in Pacific insular possessions, acceptance of mediation in case of dispute, and termination of Anglo-Japanese Alliance; two Nine-Power, outlining a policy toward China to secure her actual independence; Chinese-Japanese, for restoration of former Ger. leasehold in Shantung; U.S.-Japanese, securing Amer. cable and radio connections in Yap; Six-Power, allocating German cables in Pacific.
**Washington Elm,** Cambridge, **588,** *picture,* **1138.**
**Washington Monument,** Washington, D.C., **3684,** *picture,* **3685.**
**"Washington of South America," 447.**
**Washington University,** co-ed., non-sect. institution; at St. Louis, Mo.; founded 1853; arts and science, engineering, architecture, commerce and finance, botany, law, medicine, dentistry, fine arts; **3110.**
**Washita** (*wäsh'i-tą*) **Mts.,** Oklahoma. Same as **Ouachita Mts.**
**Washos** (*wä'shōz*), tribe of "digger" Indians occupying the e. slopes and valleys of Sierra Nevadas, in Nevada, **1767.**
**Wasps, 3690–3,** text facing **358,** *pictures,* **359, 1785, 1787;** fig wasp, **1237,** *picture,* **1238;** hornets, **1681.**
**Wasp's nest beetle,** *picture,* **367.**
**Waste,** cotton, **906.**
**Watauga Association, 3469;** Sevier in, **3181.**
**Watch,** on shipboard, **3501–2.**
**Watches.** · *See in Index* **Clocks and watches.**
**"Watchful waiting," 3746.**
**'Watch on the Rhine', 2405.**
**Water, 3693–7;** carbonated, **642;** chemical composition, **716, 2611;** density, **1403;** dew formation, **1000;** in diet, **1322, 1320, 1714;** effect on climate, **794;** Egyptian carriers, *picture,* **1093;** essential to all life, **394;** evaporation, **1207;** first appearance on earth, **1058;** freezing, **1361–2, 1720,** *picture,* **1618;** "hard" water, **571;** how it changes the earth's surface, **2791;** meters, **2206;** in plant life, **2824–6, 2828–9;** pressure in ocean depths, **2554, 2556;** produced in acid-base reaction, **10;** purification, **1715, 104, 755, 1014;** rusts iron, **3099;** stalactites and stalagmites, **664–5;** weight, **3715;** why an iron ship floats, **54.**
**Water Bearer, a** sign of the zodiac, **3840.**
**Water-beetles, 370, 3698,** *picture,* **367.**
**Water boatman,** an aquatic bug, **3696;** stridulating disk, *picture,* **2229.**
**Waterbuck,** an African antelope, **146,** *picture,* **147.**
**Water-buffalo, 527, 2765, 2768, 3081.**
**Water-bugs, 3696, 3698, 1785.**
**Waterbury,** Conn., mfg. center, 24 mi. s.w. of Hartford; pop. 91,715; watches; leads U.S. in brassware mfr.; other metal products; **864.**
**Water chinquapin,** seed of yellow water-lily, **3699.**
**Water cicada,** an aquatic bug, *picture,* **3698.**
**Water clock** or **clepsydra, 797,** *picture,* **798.**
**Water-colors, 2642.**
**Watercress,** mustard-like vegetable, **553–4.**
**Water deer,** type native to China, **981.**
**Water-dog** or **newt,** an amphibian, **3113.**
**Water dropwort,** a poisonous plant, *picture,* **2853.**
**Wateree',** r. rising in N. Carolina as the Catawba, flows s.e. 300 mi. through S. Carolina to unite with the Congaree and form the Santee; *maps,* **2518, 3291.**
**Waterfalls, 3023,** *picture,* **2789;** created by glaciers, **1721, 2516;** Grand (Hamilton R.), **1948;** Niagara, **2501–4;** Rhine, **3005;** Shoshone, *picture,* **1728;** Staubbach, *picture,* **3414;** Trollhättan, **3404, 3403;** Victoria, **3640–1;** Yellowstone, **3830;** Yosemite, **3831,** *picture,* **2403.**
**Water flea,** a minute crustacean, **3946.**
**Waterford.** Seaport, cap. of Waterford County, Ireland, on estuary Waterford Harbor; pop. 28,000; stronghold of Danes; captured by Strongbow 1171; attacked by Cromwell 1649, taken by Ireton 1650.
**Waterfowl** or *Anseres,* an order of fowl-like swimming birds, **412, 3949,** *picture,* **414;** includes ducks, **1044–6;** geese, **1487–8;** swans, **3399–3400.**
**Water gas, 1407.**
**Water glass,** sodium silicate, **3272.**
**Water hemlock,** a poisonous plant, **2854.**
**Water hyacinth,** a floating weed, **3700, 1706–7.**
**Watering-pot shell, 3945,** *picture,* **3203.**
**Water-lily, 3698–9,** *picture,* **2828;** adaptation to surroundings, **1076, 3700;** leaves, **3700;** not a true lily, **2009;** sacred lotus, **2063;** seeds, **3700;** stems, **3700;** *Victoria regia,* **3699, 1546;** yellow pond-lily, *pictures,* **474.**
**Waterloo',** Iowa. City on Cedar R. 50 mi. n.w. of Cedar Rapids, in farming and stock-raising region; pop. 36,230; foundry products, machinery, farm implements, refrigerators.
**Waterloo, battle of** (1815), **3699–3700;** Napoleon, **2396;** Wellington, **3717.**
**Waterman, L. E.,** Amer. inventor, **2712.**
**Watermarked paper, 2668.**
**Watermelon, 2196;** food value, **1321;** introduced into Europe, **932;** when and how to plant, **1397.**
**Water meters, 2206.**
**Water moccasin,** a poisonous snake, **2274,** *picture,* **3258;** belongs to pit-vipers, **3646, 3259.**
**Water-plants, 3700.**
**Water polo, 2873.**
**Water-power, 3694–5;** Alaska, **74;** Canada, **604, 606, 3694, 2582;** hydroelectric, **3695;** in Italy, **1838;** Labrador, **1948;** originally derived from sun, **1148;** in Sweden, **3404;** types of turbines used, **3554.** —*In U.S.,* **3694, 3584, 1124,** *picture,* **3697;** conservation, **869, 870;** in Idaho, **1725, 1729;** Keokuk Dam, **1804, 1806;** Me., **2126;** Mass., **2169;** Minn., **2256,** *picture,* **2255;** Mont., **2310;** Muscle Shoals, **72;** N.H., **2454;** N.Y. state, **2485;** Niagara, **2502;** S.C., **3290;** Tenn., **3466, 3468;** Wash., **3688.** *See also in Index* **Dam.**
**Waterproofing,** of garments, **3072, 3076;** use of "viscose," **673.**
**Water-scavenger beetles, 371.**
**Water scorpion,** a water-bug, **3698.**
**Water-skater** or **water-strider, 3698.**
**Water snakes, 3261.**
**Water-soluble vitamins, 3652.**
**Water spider,** a spider which nests under water, **3324,** *picture,* **3326;** name also applied to water-bug, **3698.**
**Waterspout, 3700–1.**
**Water-stick,** an aquatic bug, **3698.**
**Water-strider,** a slender long-legged aquatic bug, *picture,* **3698.**
**Water supply, 3701–4.**
**Water-tiger,** a larva of the diving-beetle, **371.**
**Watertown,** Mass., town on Charles R. 8 mi. w. of Boston; pop. 21,457; U.S. arsenal; woolen goods, hosiery, starch, needles, automobiles, rubber goods; Mt. Auburn Cemetery, **472.**
**Watertown,** N.Y. City on Black R. 70 mi. n. of Syracuse; pop. 31,285; paper and wood pulp, air brakes, corsets, machinery; dairy interests.
**Watertown,** S.D. City on Big Sioux R. 100 mi. n. of Sioux Falls; pop. 9400; trade center for rich farming region.
**Water transportation, 3524–6.** *See in Index* **Canals; Ships.**
**Water tube boiler, 3349.**
**Water turbine, 3554,** *picture,* **3695.**
**Water turkey.** *See in Index* **Darter.**
**Waterville,** Me. City on Kennebec R. 18 mi. n.e. of Augusta; pop. 13,351; manila, paper, textiles; Colby College.
**Watervliet,** N.Y. Mfg. city on Hudson R. opposite Troy; pop. 16,073; U.S. govt. arsenal.
**Waterwheels, 3695;** turbines, **3553–4.**
**Water-witch, 1515.**
**Waterworks, 3701–4;** aqueducts, **163–4;** artesian wells, **221–2;** dams, **954;** Egypt. bucket wheel, *picture,* **1827;** plumbing, **2840;** public utilities, **3704, 2932;** pumps, **2934,** *pictures,* **2935.**
**Watling Island,** small isl. of Bahamas, Brit. W. Indies, 225 mi. n.e. of Cuba, **305.**
**Watling Street,** England. Great Rom. road from Dover to London and past St. Albans to Wroxeter.
**Watson, John.** *See in Index* **Maclaren, Ian.**
**Watson, Sir William** (born 1858). Eng. poet, classical and dignified in tone but lacking in inspiration ('Wordsworth's Grave'; 'The Purple East').
**Watson, Sir William** (1815–87), Eng. physicist, **1118.**
**Watt, James** (1736–1819), Eng. inventor of steam engine, **3704–5, 3348;** centrifugal governor, **682;** Soho factory, **427;** tea-kettle anecdote, **1221.**
**Watt,** unit of electric power, **1116.**
**Watteau** (*wä-tō'*), **Jean Antoine** (1684–1721). Fr. painter of gay pageants of the frivolous artificial 18th cent. which his poetic imagination endows with strange pathos; "the founder and at the same time the culmination" of a school of revolt against "the pompous decaying classicism" of Louis XIV's time ('Embarkation for Cythera').
**Watterson, Henry** (1840–1921). "Marse Henry," Amer. journalist and orator, b. Washington, D.C.; founder and editor of Louisville *Courier-Journal.*
**Wattle,** an acacia tree, **265, 3283;** bark used in tanning, **1976.**
**Watts, George Frederick** (1817–1904), Eng. portrait and allegorical painter and sculptor, **2632;** *picture,* 'Sir Galahad', frontispiece, Vol. 6.
**Watts, Isaac** (1674–1748). Eng. clergyman, author of some of most famous hymns and most familiar lines in Eng. language ("O God, our help in ages past"; "Joy to the world"; "Hush, my dear, lie still

and slumber"; "How doth the little busy bee"; "Let dogs delight to bark and bite").
**Wat Tyler's Rebellion** (1381), **3571–2, 3016.**
**Wauke'gan,** Ill. Mfg. city and shipping point for lumber, coal, etc., on L. Michigan 35 mi. n. of Chicago; pop. 19,226; steel, brass, and iron products, sugar.
**Wau'kesha,** Wis. City on Fox R. 16 mi. w. of Milwaukee; pop. 12,558; mineral springs, health resort; iron and steel products; fiber furniture; Carroll College.
**Wau'sau,** Wis. Industrial city near center on Wisconsin R.; pop. 18,-661; fine water-power; lumber products, paper, granite.
**Wauters,** (*vō-tĕr'*), **Emile** (born 1846). Belgian portrait and historical painter ('The Madness of Hugo van der Goes'; 'Mary of Burgundy before the Magistrates of Ghent'; 'Cairo and the Banks of the Nile').
**Wave-motion,** a motion which transmits energy by vibrations of a medium; in ether, **1180, 3311–2;** longitudinal vibrations (sound waves in air), **3276;** transverse vibrations (water waves), **3705–6.**
**Waverley novels,** by Sir Walter Scott, **3151.**
**Waves,** in water, **3705–6;** in ether, **1180, 1122;** Hertzian waves (in radio), **3760, 1122, 3766;** light waves, **1998, 3311-2, 1122;** radiant heat, **1619–20;** sound waves, **3276, 3763–4;** X-rays, **3825.**
**Wax,** **3706;** distinguished from gums, **1552;** in lead pencil, **2712;** mineral, **2750;** produced by bees, **360, 362,** *pictures,* **361.**
**Wax calf leather, 1977.**
**Waxwing,** a bird, **3706;** care of young, **408;** eats insects, **402.**
**Waycross,** Ga. City 95 mi. s. of Savannah; pop. 18,068; lumber products, naval stores, packed meats, car and repair shops.
**Wayne** (*wān*), **Anthony** (1745–96), Amer. Rev. soldier, **3706–7.**
**Wayne, Fort.** *See in Index* **Fort Wayne.**
**Weak verbs, 3628.**
**Weald** (*wēld*), **The.** Dist. of s.e. England between N. and S. Downs; formerly forested; populated by S. Saxons in 5th cent.
**Wealth,** in economics, **1077;** measured by money, **2281.**
**Weapons:** arms and armor, **214–5;** of Bronze Age, *pictures,* **515;** civilization influenced by, **771,** *picture,* **772;** iron first used, **297,** *picture,* **296.** *See also in Index* **Bow and arrow; Cannon;** etc.
**'Wearing o' the Green', 2405.**
**Weasel,** a long-bodied carnivorous animal, **3707;** altitude range, *picture,* **397.**
**Weasel family,** the *Mustelidae,* **304,** *picture,* **3776;** ermine, **1174;** wolverine, **3776.**
**Weather:** atmosphere, **50–3;** clouds, **808–9;** cyclones, **944, 3366–7;** dew formation, **1000;** distinguished from climate, **794;** fog, **1316;** frost, **1375–6;** hail, **1559;** lightning, **2006–7;** rain, **2972–4;** snow, **3261–2;** storms, **3366, 3700–1;** winds, **3750–1.** *See also in Index* **Climate** and the principal topics above by name.
**Weather Bureau,** U.S., **3707–9, 3600.** *See in Index* **Climate; Meteorology; Weather.**
**Weaver-bird, 3710.**
**Weaver's knot,** 1939, *picture,* **1938.**
**Weaving,** baskets, **343;** textiles *see in Index* **Spinning and weaving.**
**Web,** of spider, **3320–2,** *pictures,* **3321, 3322, 3325.**
**Webb, Sidney** (born 1859). Eng. political economist, Fabian Socialist, collaborator with his wife, Beatrice Potter Webb ('History of Trade Unionism'; 'Industrial Democracy'); a leader in Eng. Labor party.
**Weber** (*vā'bĕr*), **Carl Maria von** (1786–1826). Ger. composer, founder of romantic school of Ger. opera ('Der Freischütz').
**Weber River,** Utah. Rises in n.e. and flows n.w. passing through the Wasatch Mts. by a gorge called Weber Canyon and enters Great Salt Lake.
**Webster, Daniel** (1782–1852), Amer. orator and statesman, **3710–1;** Bunker Hill oration, **534;** and Calhoun, **575, 576;** debate with Hayne, **3710, 1857;** quoted, **116, 3601, 3710;** sec. of state, **3571, 1240;** supports Compromise of 1850, **856.**
**Webster, Henry Kitchell** (born 1875). Amer. novelist, b. Evanston, Ill. ('The Real Adventure'; 'The Painted Scene').
**Webster, John** (d. 1624), Eng. dramatist, ranked by Swinburne as second only to Shakespeare among Eng. poets, **1034;** chief works, **1038.**
**Webster, Noah** (1758–1843), compiler of first Amer. dictionary of Eng. language, **3711–2, 3314.**
**Webster,** Mass. Town 15 mi. s. of Worcester; pop. 13,258; has beautiful 1200-acre lake; textiles, shoes, machinery.
**Webster-Ashburton Treaty, 3571, 2129.**
**Webster-Hayne debates, 3710, 1857.**
**Wedekind** (*vā'dē-kĭnt*), **Frank** (1864–1918). Ger. dramatist ('Spring's Awakening'); many of his plays deal with problems of sex and have caused great controversy.
**Wedge,** a mechanical device, **2187, 2188, 2190.**
**Wedgwood, Josiah** (1730–98), most famous Eng. potter; originator of "Wedgwood ware" and "queen's ware" (named in compliment to Queen Charlotte); **2906;** grandfather of Charles Darwin, **963.**
**Wednesday,** origin of name, **2560, 969.**
**Weed, Thurlow** (1797–1882). Amer. journalist and Whig and Republican political "boss," enemy of the "Albany Regency" and member of "the political firm of Seward, Weed, and Greeley"; influential in obtaining nomination of Harrison, Taylor, and Scott.
**Weeds, 3712–3;** sced consumed by birds, **402;** in a wild garden, **2416.**
**Weehaw'ken,** N.J., village 3½ mi. n. of Jersey City; makes embroideries; famous dueling ground, **1569.**
**Week, 3713;** day, **969;** Sabbath, **3103.**
**Weeks, John Wingate** (born 1860). Amer. banker and political leader, b. Lancaster, N.H.; graduated U.S. Naval Academy 1881; representative from Massachusetts 1905–13, senator 1913–19; sec. of war in Harding's cabinet.
**Weems, Mason Locke** (1760?–1825). Amer. preacher, author of the 'Life of Washington' which gave currency to the hatchet and cherry tree story and other anecdotes now generally discredited.
**Weeping Philosopher.** *See in Index* **Heraclitus.**
**Weeping willow, 3743.**
**Weevils,** beetles with snouts, **3713, 371,** *pictures,* **904, 1785;** boll weevils attack cotton, **906.**
**Weft,** in loom or fabric, **904.**
**"We have met the enemy and they are ours," 2730.**
**Weichsel** (*vĭĸ'sĕl*) **River.** Same as **Vistula.**
**Weight,** defined, **1508,** table of specific gravities, **4042.**
**Weights and measures. 3713–5, 1425;** Bureau of Standards, **3599;** foot, **1324;** metric system, **2206;** microns, **303, 2230;** origin of Troy weights, **1219.** *See also in Index* **Units.**
**Weihaiwei** (*wā-hī-wā'*). Port and naval coaling station on n.e. coast of Shantung, China; 285 sq. mi.; pop. 150,000; leased by Gt. Brit. 1898; restoration pledged at Washington conference 1922.
**Wei-ho** (*wī-hō'*). In n. China, largest tributary of Hwang-ho (Yellow R.); flows e. 500 mi. and joins Hwang-ho at point where it turns from s. to e.; trade route from interior.
**Weimar** (*vī'mär*), Germany, cap. of Thuringia; pop. 35,000; **3715–6;** constitutional convention at, **1445;** intellectual center in Goethe's time, **1478, 3137;** theater, *picture,* **1443.**
**Weinsberg** (*vīns'bĕrĸ*). Town of Württemberg, Germany, 28 mi. n.e. of Stuttgart; victory of Ger. king Conrad III over Count Welf of Bavaria 1140; once free imperial city.
**Weir** (*wēr*), **J. Alden** (1852–1919), Amer. impressionist painter, b. West Point, N.Y., son of Robert Walter Weir; his painting characterized by delicate and harmonious arrangement of masses; **2634.**
**Weir, Robert Walter** (1803–89), Amer. portrait and historical painter, b. New Rochelle, N.Y.; for 30 years taught drawing at U.S. Military Academy ('The Embarkation of the Pilgrims', in U.S. Capitol; 'Landing of Hendrik Hudson').
**Weismann** (*vīs'män*), **August** (1834–1914), Ger. biologist; advanced theory that changes in the characteristics of a species are due to changes in germ-plasm; **1210.**
**"Welcome Stranger,"** gold nugget, **2195.**
**Welding, 3716;** borax used, **464;** oxyacetylene, **7;** thermit, **105.**
**Welfs.** *See in Index* **Guelfs and Ghibellines.**
**Well, 3701–2;** artesian, **221–2;** deepest, *picture,* **51;** oil, **2749–53;** "windlass," *picture,* **3696.**
**Welland,** Ontario. Railroad and mfg. city on Welland Canal and R.; pop. 9000; govt. docks and turning basin, hydro-electric plants, cotton and planing mills, iron and steel mfrs.
**Welland Canal,** Canada, connecting L. Erie with L. Ontario; **3716, 2583, 1514.**
**Welland River.** A river of e.-cent. England flowing 70 mi. n.e. to the Wash.
**Weller, Sam,** in Dickens' 'Pickwick Papers', **1008.**
**Welles** (*wĕlz*), **Gideon** (1802–78), Amer. statesman, b. Glastonbury, Conn.; able sec. of navy under Lincoln and Johnson; though ignorant of navigation and ship construction, he showed great executive ability and was of value to Lincoln as adviser on general policies; *picture,* **2015.**
**Wellesley** (*wĕlz'lĭ*), **Richard Colley, Marquis of** (1760–1842). Brit. statesman, one of greatest Eng. colonial administrators, gov.-gen. of India 1797–1805; "found the (Brit.) East India Co. a trading body, left it an imperial power"; elder brother of Duke of Wellington.
**Wellesley College,** at Wellesley, Mass.; women, non-sect.; opened 1875 (chartered 1870); collegiate work, music, art, pedagogy; *pictures,* **2165, 832.**
**Wellington, Arthur Wellesley,** first **Duke of** (1769–1852), Brit. soldier and statesman, **3716–7, 3700;** Cath. Emancipation Act, **2706;** and Irish question, **2559;** opposes Reform Bill, **3083.**
**Wellington,** port and cap. of New Zealand on s. coast of North Isl.; pop. 101,000; large trade; varied mfrs.; Victoria College of U. of New Zealand; **2500.**
**Wells, Carolyn** (born 1869). Amer. writer of novels, parodies, and humorous verse, b. Rahway, N.J. ('At the Sign of the Sphinx'; 'Fluffy Ruffles'; 'A Nonsense Anthology').

**Wells, Charles Jeremiah** (1798–1879). Eng. poet famous for biblical drama 'Joseph and Brethren'; written in 1823, it passed unnoticed for half a cent. until Rossetti and Swinburne made it a shibboleth.
**Wells, David Ames** (1828–98). Amer. political economist, b. Springfield, Mass.; free trade advocate; influenced creation of Federal Bureau of Statistics in Treasury Dept.
**Wells, Herbert George** (born 1866), Eng. novelist; a remarkably prolific and inspiring writer who makes the novel a vehicle for his ideas on social questions ('The Time Machine'; 'New Worlds for Old'; 'Tono-Bungay'; 'Mr. Britling Sees It Through'; 'Outline of History'); **1167, 2540–1.**
**Wells, Horace** (1815–48), Amer. dentist, **124.**
**Wells,** England. City 18 mi. s.w. of Bath; famous 13th cent. cathedral; important Saxon town; made bishop's see in 905.
**Wells College.** At Aurora, N.Y.; women, non-sect.; founded 1868; arts and science.
**Welsbach** (*wĕls'bäĸ*), **Karl Auer von** (born 1858). Austrian chemist and inventor, discoverer of rare elements and inventor of Welsbach light and osmium incandescent electric light.
**Welsbach** (*wĕlz'bäĸ*) **mantle, 1407.**
**Welsh language, 674, 1162, 1814.**
**Wends,** name given by Germans to w. Slavic tribes, **3250.**
**Wenner** or **Väner, Lake,** largest in Scandinavian peninsula and 3d largest in Europe; 2149 sq. mi.; **3403,** *map,* **2531.**
**Wentworth, Thomas, Earl of Strafford.** *See in Index* **Strafford.**
**Wenzel** (*vĕn'tsĕl*) or **Wenceslaus** (*vĕn'sĕs-lous*) (1361–1419), king of Bohemia and Holy Roman emperor; attempt to settle Great Schism antagonized archbishop of Mainz, who persuaded the Imperial electors to depose him; **2086.**
**Werner** (*vĕr'nĕr*), **Zacharias** (1768–1823). Ger. romantic dramatist; 'Martin Luther', 'Der 24 Februar', his best plays, are typical of the lurid "fate tragedy"; in 1814 he became a Cath. priest and was noted for his sensational eloquence.
**Weser** (*vā'zĕr*), r. of Germany rising in s. Hanover; flows n. 280 mi. to North Sea; **1439, 502.**
**Wesley, Charles** (1707–88), Eng. preacher and hymn-writer (brother of John), **3718.**
**Wesley, John** (1703–91), Eng. preacher; founder of Methodism, **3717–8, 3774.**
**Wesleyan College,** at Macon, Ga.; Meth. Episc. institution for women; founded 1836; arts and science, music; **1432.**
**Wesleyan University.** At Middletown, Conn.; men, non-sect.; established 1831 by Meth. Episc. church; arts and science.
**Wes'sex,** anc. kingdom of W. Saxons in s. Britain; founded by Cerdic and Cynric 519; Egbert became king 802, and later ruled all Britain; in Thomas Hardy's novels, **1582.**
**West, Benjamin** (1738–1820), Amer. historical painter, **2634.**
**West Allis,** Wis. Industrial suburb 4 mi. w. of Milwaukee; pop. 13,745; automobiles, trucks, engines, machinery.
**West Baden,** town and watering place in s. Indiana, 45 mi. s. of Bloomington; pop. 832; **1760.**
**Westboro,** Mass., town 12 mi. e. of Worcester; straw goods, underwear, etc.; pop. 5789; birthplace of Eli Whitney, **3735.**
**West Bromwich** (*brŏm'ich*), England. Mfg. town 5 mi. n.w. of Birmingham; pop. 73,000; coal and iron mines, numerous metal mfrs.
**West Chester,** Pa. Borough 20 mi. w. of Philadelphia; pop. 11,717; dairy implements, dustless crayons, gas engines, shipping tags; creameries, tree nurseries.
**Westerly winds, 3750,** *picture,* **3751;** effects upon rainfall, **2973.**
**Westermarck, Edward Alexander** (born 1862). Finnish-British anthropologist, professor at U. of London ('Origin and Development of the Moral Ideas'; 'History of Human Marriage').
**Western Australia.** Largest state of Australia, comprising w. third of continent; 975,920 sq. mi.; pop. 332,000, mainly on coast and in mining sections; gold, copper, silver mining, farming; cap. Perth.
**Western College for Women.** At Oxford, Ohio; non-sect., founded 1853; liberal arts.
**Western Empire,** in Rom. history, **3048.**
**Western Isles** or **Hebrides, 1625.**
**Western Maryland College.** At Westminster, Maryland; co-ed., Meth. Episc.; opened 1867; liberal arts, music, art, elocution.
**Western Reserve,** part of the Northwest Territory (now n.e. Ohio) reserved by Connecticut when latter ceded its claim to western lands, **867, 869, 2572.**
**Western Reserve University,** at Cleveland, Ohio; co-ed., non-sect.; founded 1826; arts and science, law, medicine, education, applied science; **793, 2572.**
**Western University,** at London, Ontario; co-ed.; established 1863; since 1908 non-sect.; arts, medicine, public health, music; **2057.**
**Westfield,** Mass. Town on Westfield R. about 10 mi. w. of Springfield; pop. 18,604; machinery, whips, patent leather, paper, thread, motorcycles.
**West Goths.** *See in Index* **Visigoths.**
**West Ham,** England. *See in Index* **Ham, East and West.**
**West Hartlepool,** England. *See in Index* **Hartlepool.**
**West Hoboken,** N.J. Town adjoining Hoboken; pop. 40,074; silk and embroideries.
**West Indies,** isl. group in Atlantic Ocean n. and e. of Caribbean Sea; 92,000 sq. mi.; pop. 6,000,000; **3718, 644,** *map,* **2514–5;** *Study Outline,* **3894–5;** Bahamas, **305;** Barbados, **329;** coffee introduced, **822;** Columbus discovers, **849;** cotton, **904;** Cuba, **936–8;** early trade with U.S., **2927;** ebony, **1073;** fruits, **2011;** Guadeloupe, **1545;** Haiti, **1560–1;** Jamaica, **1859–60;** Las Casas' work for Indians, **1965;** land crabs, **914;** logwood, **2046;** Martinique, **2156;** monkey's dinner bell, **3171;** negro population, **2434;** Porto Rico, **2885–7;** Santo Domingo, **3125–6;** Trinidad, **3541;** turtle-fishing, **3563;** Virgin Isls., **3651;** slave trade, **2927.**
**Westinghouse, George** (1846–1914), Amer. engineer, inventor of the air-brake, **492–3.**
**Westminster, City of.** Metropolitan borough of London, Eng.; pop. 141,000; royal palaces, Westminster Abbey, Houses of Parliament, Cathedral, National and Tate galleries.
**Westminster Abbey,** famous church in London, **3718–9, 2054,** *pictures,* **2049, 3719;** Edward the Confessor begins, *picture,* **1087.**
**Westminster College.** At Fulton, Mo.; men, Presb.; founded 1849 as Fulton College; arts and science.
**Westminster College.** At New Wilmington, Pa.; co-ed.; founded 1852 as Westminster Collegiate Institute; arts and science, music, art.
**Westminster Hall,** London, **2054.**
**West'morland,** county of n.w. England; 786 sq. mi.; pop. 60,000; wooded, mountainous; w. part in Lake District; cattle and sheep raising; cap. Appleby; **1160.**
**West New York,** N.J. Industrial town on Hudson R. connected by ferry with New York; pop. 29,926; pianos, silks, textiles, rubber goods, cottonseed oil.
**Weston-super-Mare** (*mā'rĭ*). Watering place of Somerset, England, on Bristol Channel 18 mi. s.w. of Bristol; pop. 24,000.
**West Orange,** N.J. Town 13 mi. w. of New York and 5 mi. n.w. of Newark, at base of Orange Mt.; pop. 15,573; Edison Phonograph and Electrical Works.
**Westphalia** (*wĕst-fā'lĭ-ȧ*), province of w. Prussia; 7807 sq. mi.; pop. 4,500,000; large forests, coal and iron mines, extensive mfrs.; cap. Münster; **1443.**
**Westphalia, Kingdom of, 452.**
**Westphalia, Peace of** (1648), **3489.**
**West Point,** N.Y., military post on Hudson R. 52 mi. from New York City; U.S. Military Academy; important strategic point in Amer. Rev.; **2238, 219, 123.**
**West Point Military Academy, 2236–7, 3578.**
**West Prussia.** Former province of Germany on Baltic, 9862 sq. mi.; by Treaty of Versailles larger part went to Poland; remainder incorporated in Border Province (Grenzmark).
**West Quoddy Head,** Me., projection near Eastport, **3580.**
**Wes'tray,** one of Orkney Isls., 10 mi. long, **2601.**
**West Riding.** *See in Index* **Yorkshire.**
**West Springfield,** Mass. Town on Connecticut R. opposite Springfield; pop. 13,443; market gardens, r.r. shops; paper, tanks, pumps, automobile bodies.
**West Virginia,** a middle Atlantic state of the U.S.; 25,000 sq. mi.; pop. 1,463,701; cap. Charleston; **3720–3,** *maps,* **3722, 3584–5;** deepest oil well, *picture,* **51;** history, **3720, 3723;** natural features, **3720;** products and resources, **3721–3;** state flower, **3347.**
**West Virginia University,** co-ed. state institution at Morgantown, W. Va.; founded 1867; arts and science, engineering, agriculture, law, medicine, military science; *picture,* **3721.**
**Wet, Christian de.** *See in Index* **De Wet.**
**Wetter** (*vĕt'ĕr*) or **Vetter,** 2d largest lake in Sweden; 733 sq. mi.; **3403,** *map,* **2531.**
**Wexford.** Seaport and cap. of Wexford County, Ireland, in s.e. on Wexford Harbor; pop. 12,000; important Danish settlement; taken by Cromwell 1649; headquarters of rebels 1798.
**Weyden** (*vī'dĕn*), **Roger van der** (originally Roger de la Pasture) (1400?–64), Flemish painter, **520.**
**Weyler** (*wā'lĕr*), **Valeriano** (born 1859), Span. colonial officer; captain-general of Cuba 1896–97, nicknamed in U.S. "Butcher" Weyler for ruthless methods of repressing rebellion; **3306.**
**Weyman** (*wī'măn*), **Stanley John** (born 1855). Eng. novelist ('The House of the Wolf'; 'A Gentleman of France'; 'Under the Red Robe').
**Weymouth** (*wā'mŭth*), Mass. Industrial town 12 mi. s.e. of Boston; pop. 15,057; shoes, hammocks, fireworks, machinery, fertilizer, woolscouring plants; settled 1623.
**Weymouth and Melcombe Regis** (*mĕl'kŭm rē'jĭs*). Seaport and watering place of s. England on Weymouth Bay; pop. 23,000; shipping and passenger trade; shipbuilding, stone quarrying.
**Whale, 3723–9;** attacked by squids, **942;** dolphin related, **1026–7;** evolutionary position, *diagram,* **128;** flipper, *picture,* **1572;** how Eskimos harpoon, **1177;** ivory from, **1853;** length of life, **126;** modified verte-

brate structure, **3634**; New Bedford, Mass., former whaling center, **2448**; porpoise related, **2884**; teeth lost before birth, **1209**; story, 'How the Whale Learned to Smoke', **3727–9**.
**Whaleback,** a type of ship, **3218**, *picture*, **1512**.
**Whalebone, 3724.**
**Whale-headed stork,** *picture*, **3362**.
**Whale Island** or **Kvalo,** Norway, *picture*, **2536**.
**Whale oil, 3724, 3726, 1959.**
**Whaling, 3726.**
**Whal'ley, Edward** (d. 1678?), one of Cromwell's generals, signed death warrant of Charles I; in New Haven, **2456**.
**Wharton** (*hwąr'tŏn*), **Edith** (born 1862). One of the most finished artists among contemporary Amer. novelists ('The House of Mirth'; 'Age of Innocence').
**Wharton School of Finance and Commerce,** part of U. of Pennsylvania, **3140**.
**"Whatever is, is right," 2879.**
**"What's in a name?" 3058.**
**Wheat, 3730–2**; in Argentina, **192**; Australia, **264, 269**; bread and baking, **496–500**; Canada, **602, 2136–7, 3128**; Chile, **736**; developed from grass, **2830**; flour milling, **1301–4**; food value, **1321, 2926, 1303**; France, **1346**; grain elevators, **1492**; Hungary, **271, 1703**; macaroni, **2093**; N. Amer., **2516**; pests, **752, 1645, 3099–3101**; Rumania, **3081**; Russia, **3086,** *picture*, **3089**; Siberia, **3228**; starch content, **3344**; structure of grain, **1302**; threshing, **3493**; Uruguay, **3608**; world's chief producing regions, **3730, 3732, 2973.** —*In U.S.*, **3586, 3588**; Idaho, **1727**; Kan., **1910**; Minn., **2253**; N.D., **2524,** *picture*, **2522**; Red River valley, **2986**.
**Wheaton,** Ill. City 25 mi. w. of Chicago, shipping point for agricultural region; pop. 4150; Wheaton College.
**Wheaton College.** At Wheaton, Ill.; co-ed., non-sect.; founded 1860; collegiate work, music, commercial art, domestic science.
**Wheatstone, Sir Charles** (1802–75), Eng. physicist; invents early telegraph system, **3454**; invents stereoscope, **3354**.
**Wheel,** a mechanical device, **2188**; invention of wheeled vehicles, **3524**.
**Wheel, potter's, 2903, 2904,** *pictures*, **2907**.
**Wheel and axle,** a mechanical device, **2187–8**.
**Wheel animalcules,** or rotifers, **3814, 3945** evolutionary position, **128**.
**Wheel bug,** large bug of s. U.S. with a semicircular elevation on the thorax like a toothed wheel; eggs, *picture*, **1091**.
**Wheeler, Benjamin Ide** (born 1854). Amer. classical scholar and educator, b. Randolph, Mass.; pres. of U. of California 1899–1919.
**Wheeler, Joseph** (1836–1906), Amer. Civil War (Confederate) general, b. Augusta, Ga., ranked next to Stuart as cavalry raider; in Span.-Amer. War, **3306**.
**Wheeler, William Almon** (1819–87), Amer. statesman, b. Malone, N.Y.; author of "Wheeler Compromise" for settling political differences in Louisiana; vice-president of U.S., **3636**.
**Wheeler Peak,** mt. in e.-cent. Nevada; highest point in state (13,058 ft.); *map*, **2445**.
**Wheeling,** W. Va. Shipping and industrial center and largest city in state, in extreme n. on Ohio R.; pop. 56,208; iron and steel products, pottery, glass, and tobacco.
**Wheel-lock gun,** *picture*, **1253**.
**Whelk,** a marine mollusk, **3256, 2280, 3945**; eggs, *picture*, **1091**; shell, **3202**.
**"When Adam delved and Eve span," 3571.**
**Whetstones,** source of, **207**.
**Whewell** (*hū'ĕl*), **William** (1794–1866). Eng. scientist and philosopher ('History of the Inductive Sciences').
**Whey** (*hwā*), of milk, **709**.
**Whig party** (England), **694, 2869**; Corn Laws repealed, **2706**; Gladstone, **1468**. *See also in Index* **Liberal party.**
**Whig party** (U.S.), origin of, **15, 2869–70**; Clay defeated, **785, 2872**; W.H. Harrison elected, **1594**; conflict with Tyler, **3570–1**; Taylor elected, **3444**; candidates and policies (1852–56), **1240, 3153**; favors national expansion, **3604**; resists spread of slavery, **2012**.
**Whippet tanks, 3433, 3806.**
**Whipping post, 2919.**
**Whip'poorwill, 3732–3,** *pictures*, **2925, 411**; ground nest, **406**; a long-winged bird, **416**; protective coloring, **2924**.
**Whirl'igig,** a water-beetle, **371,** *picture*, **3698**.
**Whirlpool, 3733**; Charybdis, **3230, 2563**; Maelstrom, **2532, 3733**; Niagara, **2502**.
**Whirlpool Rapids,** Niagara R., **2502**.
**Whiskey, 84, 1918.**
**Whiskey Rebellion, 3678, 3604.**
**"Whiskey Ring,"** popular term for a group of revenue officers and distillers who were convicted of having defrauded the U.S. govt. of excise taxes, amounting to nearly $2,000,000 in 1875 alone, **1499**.
**Whispering gallery, 3278.**
**Whistler, James McNeill** (1834–1903), Amer. artist, b. Lowell, Mass., great portrait painter, "master among masters" as etcher, ranking with Rembrandt, Van Dyck, Meryon; an arrogant eccentric whose quarrels and sarcastic wit made him notoriously a past master in "the gentle art of making enemies"—title of one of his own lectures (portraits of Carlyle, and of his own mother; 'Nocturne in Blue and Silver'); **2633, 2634**; as etcher, **1170**.
**Whistling swan, 3400.**
**Whitby,** seaport and resort of n. Yorkshire, England; pop. 13,000; Synod of Whitby (664) established time for Easter; home of Caedmon, **563**.
**White, Andrew Dickson** (1832–1918). Amer. diplomat and educator, b. Homer, N.Y.; first pres. of Cornell Univ. 1867–85; minister 1879–81 and ambassador 1897–1902 to Germany; ambassador to Russia 1892–94 ('The Warfare of Science with Theology'; 'Seven Great Statesmen').
**White, Edward Douglass** (1845–1921). Associate justice of U.S. Supreme Court 1894–1910, chief justice 1910–21; a Democrat and an ex-Confederate soldier appointed to the highest place on the Amer. bench by a Republican president, Taft; b. Lafourche Parish, La.
**White, Gilbert** (1720–93), Eng. country parson, naturalist, and author ('Natural History and Antiquities of Selborne', a great Eng. classic, the "first book which raised natural history into the region of literature"), **131**; quoted, **1066**.
**White, Hugh Lawson** (1773–1840). Amer. jurist and political leader, b. Iredell County, N.C.; judge of the Tennessee supreme court 1809–15, U.S. senator succeeding Jackson 1825–40; in 1836 carried Tennessee and Georgia for president.
**White, John,** Amer. colonial governor, **2521**.
**White, Maria** (d. 1853), Amer. poet, wife of J. R. Lowell, **2073, 2074**.
**White, Stewart Edward** (born 1873). Amer. novelist, b. Grand Rapids, Mich. ('The Claim Jumpers'; 'The Blazed Trail'; 'The Silent Places'; 'Conjuror's House'; and many other novels of western life).
**White, William Allen** (born 1868). Amer. journalist and author, b. Emporia, Kan.; made the *Emporia Gazette* a notable small paper; in 1896 won national reputation by editorial, "What's the Matter with Kansas?"; wrote 'The Court of Boyville'; 'A Certain Rich Man'; and other novels.
**"White ants,"** or termites, **143, 1788.**
**White arsenic, 220.**
**White Aylesbury,** a duck, **1046**.
**White Canons,** or Premonstratensian monks, **2299**.
**White cedar,** the arbor vitae, **671,** *picture*, **670**.
**Whitechapel,** slum dist. in s. London; pop. 96,346; **1541**.
**"White coal,"** water-power, **3694–5, 869.**
**White corpuscles** or **leucocytes,** in blood, **437**.
**White-crowned sparrow, 3308.**
**White currant,** fruit of bush related to gooseberry, **940**.
**White-eyed vireo, 3647.**
**Whitefield, George** (1714–70), Eng. evangelist, founder of Calvinist Methodists; said to have preached 18,000 sermons; made 7 voyages to America, preaching everywhere from Georgia to New England, **1166, 3718**.
**Whitefish,** important fresh-water food fish, **3733, 1279**; included in *Salmonidae*, **3114**.
**Whitefish Bay,** L. Superior, **1511,** *map*, **2226**.
**White Friars.** Same as **Carmelite Friars.**
**White frost, 1376.**
**Whitehall,** former royal palace, London, **2053–4**.
**Whitehall Street,** London, **2054**.
**Whitehaven,** England. Seaport and coal- and iron-mining center on Irish Sea 36 mi. s.w. of Carlisle; pop. 20,000; shipyards, iron foundries.
**Whitehead, William** (1715–85), Eng. poet; best work is verse tales in the style of La Fontaine; **2848**.
**Whitehead torpedo, 3518.**
**White Horse,** Yukon, town in s. center 100 mi. n. of Skagway, Alaska; pop. under 200; **3836, 1933**.
**White House,** official residence of president of U.S., **3733–4, 3683,** *pictures*, **3734, 3596**; British burn, **3672**.
**White Huns.** *See in Index* **Huns, White.**
**"White Indians"** of Delaware, **989**.
**Whiteing, Richard** (born 1840). Eng. novelist remembered for 'No. 5 John Street.' a vivid description of life in London slums.
**White lead, 1973**; use in paints, **2642**.
**White** or **Cistercian monks, 2299.**
**White Mountain,** a hill near Prague, Czecho-Slovakia; battle (1620), **3488**.
**White Mts.,** group of peaks and hills of Appalachian system, mainly in n. New Hampshire and extending into Maine; highest point, Mt. Washington in New Hampshire (6293 ft.); **2453–4, 158,** *map*, **2454**; forests, **3583, 1331**; in Ice Age, **1720**; logging, *picture*, **2456**; mica, **2219**.
**White Nile,** main confluent of the Nile, **2509–10, 1093,** *maps*, **40–1, 1095**; Victoria Nyanza, **3641**.
**White oak, 2547, 2548.**
**White Pekin,** a duck, **1046**.
**White pine, 2808, 2809**; annual cut, **3590**.
**White pine blister rust, 3099,** *picture*, **3100**.
**White Plains,** N.Y. Attractive residential suburb n. of New York City; pop. 21,031; scene of battle of White Plains and many skirmishes during Amer. Rev.
**White poplar, 2880.**
**White Rabbit,** in 'Alice in Wonderland', **647–50**.
**White race.** Same as **Caucasian.**
**White River,** Ark., rises in Boston Mts. near w. border; semi-circular

course 400 mi. long, when it divides, one channel flowing into Arkansas R. and other directly into Mississippi; *maps*, **2270, 208.**

**White River,** Ind., chief tributary of Wabash; 2 branches; 350 mi.; navigable to Martinsville; **1757, 1759,** *map,* **1758;** in Indianapolis, **1762.**

**White River,** S.D., a tributary of the Missouri; rises in n.w. Nebraska; flows n.e. 325 mi. through South Dakota, **3296.**

**White Russia,** division of Russia, **3084,** language, **3096.**

**White Sea,** arm of Arctic Ocean (36,000 sq. mi.) extending s.w. into n. Russia between Kola and Kanin peninsulas, **3085,** *map,* **1196–7;** discovered by Ottar, **2859.**

**White Star Line, 3210, 3218.**

**White Sulphur Springs,** W.Va., celebrated resort in s.e. in Greenbrier County, **3720.**

**White-tailed deer** or **Virginia deer, 980,** *picture,* **981.**

**White-throated sparrow, 3308.**

**White Tower,** London, **2048–9, 2050.**

**White walnut, 548.**

**Whitewash** or **calcimine, 2642.**

**White whale** or **belu'ga,** an Arctic cetacean closely related to the narwhal, pure white in color, 12 to 18 ft. long; valuable food and oil source; **3723.**

**White willow, 3743.**

**Whitewood** (linden), **2018.**

**Whitewood** (tulip tree), **3548.**

**Whiting,** Ind., city with good harbor on L. Michigan 16 mi s.e. of Chicago; pop. 10,145; industries, **1760, 2576.**

**Whiting,** a form of chalk, **685;** use in calcimine, **2642;** in putty, **2939.**

**Whiting,** a fish, **1279.**

**Whit'lock, Brand** (born 1869), Amer. municipal reformer, diplomat, and author, b. Urbana, Ohio; minister to Belgium 1913–17; his handling of Cavell case, relief work, and difficulties due to Ger. occupation won wide notice; mayor of Toledo, **3512.**

**Whitman, Marcus** (1802–47), Amer. pioneer, b. Rushville, N.Y.; missionary to Indians near Walla Walla, Wash.; in 1842–43 rode horseback across the wild continent to induce the Amer. Board of Foreign Missions to rescind its purpose to give up his mission; murdered by Indians; **2598.**

**Whitman, Walt** (1819–92), Amer. poet, **3734–5, 113,** *picture,* **114.**

**Whitman College.** At Walla Walla, Wash.; non-sect., co-ed.; founded as Cong. seminary 1859, chartered as college 1882; liberal arts, music.

**Whitney, Eli** (1765–1825), Amer. inventor, **3735–6.**

**Whitney, Josiah Dwight** (1819–96). Amer. geologist, b. Northampton, Mass.; determined heights of Rocky Mt. summits; **3736.**

**Whitney, William Dwight** (1827–94). Amer. philologist, one of great scientific grammarians ('Life and Growth of Language').

**Whitney, Mt.,** Calif., loftiest summit in U.S. outside of Alaska (14,502 ft.), **3736,** *picture,* **584.**

**Whitsunday** or **Pentecost.** A feast day of Christian church, 7th Sunday after Easter; commemorates descent of Holy Spirit on disciples.

**Whit'tier, John Greenleaf** (1807–92), Amer. poet, **3736–7,** *picture,* **113;** 'Barbara Frietchie', **781;** quoted, **116, 856, 1140.**

**Whit'tington, Richard** (d. 1423). London merchant and lord mayor; left great fortune to charities; nearly two centuries after his death arose the legend of "Dick Whittington and his cat" and of the Bow bells that chimed to bid the runaway starveling "Turn again Whittington, Lord Mayor of London."

**Whole wheat flour, 1303.**

**Whooping cough,** cause of, **1450.**

**Whooping crane, 3365.**

**Whortleberry,** a blueberry, **439.**

**Wichita** (*wich'i-tą*), Kan., industrial city and wholesale trade center on Arkansas R. 47 mi. n. of Oklahoma border; pop. 72,128; live stock and grain market; large mills and packing plants; automobiles, tractors, trucks; Fairmount College and Friends Univ.; **1911.**

**Wichita Falls,** Tex. Rapidly growing city 100 mi. n.w. of Ft. Worth; pop. 40,075; near extensive oil fields; large oil refineries; motor trucks, glass products, doors.

**Wichita Mts.,** range in s. Oklahoma, **2576.**

**Wichitas,** tribe of Plains Indians originally living in Wichita Mts. of Oklahoma; roamed n. and e. to Kansas R.; **1767.**

**Wicket,** in cricket, **919.**

**Wiclif.** Same as **Wyclif.**

**Widgeon.** The name of two river ducks: the Amer. widgeon or baldpate (*Mareca americana*) found in most regions of N. Amer. is 18 to 21 in. long, the males brownish-gray above and brownish red and white below with a white head crest; the European widgeon (*Mareca penelope*), which occurs in the n. part of the Eastern Hemisphere and occasionally in the Western, has the head and neck cinnamon-red.

**Wieck** (*vēk*), **Clara.** *See in Index* **Schumann, Clara.**

**Wieland** (*vē'länt*), **Christoph Martin** (1733–1813), Ger. epic poet, **1436, 1478;** chief works, **1438.**

**Wieliczka** (*vyā-lĭtch'kä*). Polish town 9 mi. s.e. of Cracow; pop. 7000; famous salt mines.

**Wien** (*vēn*). Same as **Vienna.**

**Wiesbaden** (*vēs-bä'dĕn*), Prussia, beautiful watering place on s. slopes of Taunus range 3 mi. n. of the Rhone R.; pop. 98,000; **1357.**

**Wife of Bath,** in 'Canterbury Tales', **701.**

**Wig'an,** England. Mfg. town of Lancashire, 15 mi. s. of Preston; pop. 91,000; collieries, iron and cotton industries; Mining and Technical College.

**Wiggin, Kate Douglas** (Mrs. Riggs) (born 1859). Amer. novelist and playwright, b. Philadelphia ('The Birds' Christmas Carol'; 'Rebecca of Sunnybrook Farm').

**Wiggins, Carleton** (born 1848) Amer. landscape and animal painter, **2634.**

**Wight** (*wīt*), **Isle of,** isl. off s. coast of England in English Channel; 146 sq. mi.; pop. 83,000; favorite resort; several forts; sheep-raising; chief town, Newport; **3290.**

**Wigs,** fashions in, **898.**

**Wig'wag signaling, 3233.**

**Wigwam** (*wĭg'wąm*), Indian tent, **1770.**

**Wil'berforce, Samuel** (1805–73). Eng. clergyman; position as Bishop of Oxford (1845–69) made difficult by Oxford Movement which he did not support, although he was a high churchman; prominent in House of Lords; facility in speaking earned nickname "Soapy Sam."

**Wilberforce, William** (1759–1833). Eng. philanthropist and statesman, **3249.**

**Wilcox, Ella Wheeler** (1855–1919). Popular Amer. versifier, b. Johnston Center, Wis. ('Poems of Passion').

**Wild Carrot** or **Queen Anne's lace,** a wild flower, **3712.**

**Wildcat,** various animals of cat family; name applied to lynx, **2087.**

**Wilde** (*wīld*), **Oscar** (1856–1900). Brit. poet and playwright, leader of the "esthetic" movement; chief plays, **1038.**

**Wilderness, battle of,** indecisive Civil War battle fought in n. Va., May 4–6, 1864, **1984, 779.**

**Wild turkeys, 3556.**

**Wilhelm.** *See in Index* **William.**

**Wilhelmina** (*vĭl-hĕl-mē'nä*) (born 1880), queen of the Netherlands, succeeded 1890 under regency of queen-mother, Emma; **2442.**

**'Wilhelm Meister'** (*vĭl'hĕlm mīs'tēr*), novel by Goethe, **1478.**

**Wilhelmshaven** (*vĭl'hĕlms-hä-fĕn*) or **Wilhelmshafen,** Germany, seaport, watering place, and naval station on North Sea 40 mi. n.w. of Bremen; pop. 35,000; important naval base in World War; **1629.**

**'Wilhelm Tell',** drama by Schiller, **3465.**

**Wilkes** (*wilks*), **Charles** (1798–1877), Amer. naval officer and explorer, b. New York City; Antarctic explorations, **2863;** seizes Mason and Slidell, **3539.**

**Wilkes-Barre** (*wilks'-băr-ĭ*), Pa., commercial and mfg. city 98 mi. n.w. of Philadelphia, on Susquehanna R.; pop. 73,833; shipping center for greatest anthracite coal region in U.S.; lace, silk, hosiery, locomotives, iron work, adding machines; colonial and Rev. War interest; founded 1769; coal fields, **2720.**

**Wilkie, Sir David** (1785–1841). Scotch genre and historical painter, especially noted for scenes from village life ('Pitlessie Fair'; 'Village Politicians').

**Wilkins, Mary E.** *See in Index* **Freeman, Mary Wilkins.**

**Wilkinsburg,** Pa. Residential borough adjoining Pittsburgh; pop. 24,403.

**Wilkinson, James** (1757–1825), Amer. Rev. general and adventurer, involved in Conway Cabal and treason of Aaron Burr; founded Frankfort, seizes Mobile, **2274.**

**Willamette** (*wi-lä'mĕt*), r. of w. Oregon, formed by union of McKenzie and Middleforks; flows n. 300 mi. to Columbia R.; **2594,** *map,* **2596;** farming in valley, **2596;** at Portland, **2885.**

**Willamette University.** At Salem, Ore.; Meth. Episc., co-ed.; founded 1834 as Indian mission school; became a school for white children 1844, and a univ. in 1853; liberal arts, theology, art, music, law, medicine.

**Willard, Emma Hart** (1787–1870). Amer. teacher, b. Berlin, Conn.; pioneer in higher education for women; founded Emma Willard School (Troy Female Seminary); author of 'Rocked in the Cradle of the Deep', and other poems.

**Willard, Frances Elizabeth** (1839–98), Amer. temperance leader, b. Churchill, N.Y., **3737, 3777.**

**Willcox, J.,** Amer. inventor, **3187.**

**William I, the Conqueror** (1027?–87), king of England, **3739–40, 1589, 1152–3;** at battle of Hastings, **1595–6;** defeats Henry I of France, **1636;** builds Tower of London, **2051.**

**William II, Rufus** (1056?–1100), king of England, **3740.**

**William III** (of Orange) (1650–1702), king of England and stadholder of Holland, **3740–1;** Anne supports, **139;** Bill of Rights, **393;** at battle of the Boyne, **1810;** and Marlborough, **2149–50;** Mary aids, **2157.**

**William IV** (1765–1837), king of England, **3741, 1430;** Reform Act, **3083, 2869.**

**William I** (1797–1888), first Ger. emperor, **3737–8;** coronation, **3633;** Ems dispatch, **427.**

**William II** (born 1859), Ger. emperor, **3738;** deposes Bismarck, **428;** foreign policy, **1449;** and World War, **3790, 3791, 3804, 3808.**

**William I** (1772–1844). First king of Netherlands, proclaimed king 1814 after revolt against France; harsh measures provoked revolt and loss of Belgian provinces 1830; abdicated 1840.

**William II** (1792–1849). King of the Netherlands, succeeded 1840; gave Netherlands constitution 1848, and averted revolution.
**William III** (1817–90). King of the Netherlands, succeeded 1849; father of Queen Wilhelmina.
**William I, the Silent,** prince of Orange (1533–84), **3741;** and siege of Leyden, **2443;** tomb, **2440–1.**
**William II,** prince of Orange (1626–50), grandson of William the Silent, married Mary, princess royal of England, daughter of Charles I; portrait by Van Dyck, *picture,* **2636.**
**William I, the Lion** (1143–1214). King of Scotland; succeeded his brother Malcolm IV 1165; invaded England 1174, was captured and forced to do homage to Henry II.
**William and Mary,** of England. *See in Index* **William III; Mary II.**
**William of Wied** (*vēd*), **Prince** (born 1876), king of Albania Feb. to Sept. 1914; 2d cousin of William II of Germany; **79.**
**William of Wykeham** (1324–1404). Eng. statesman and prelate, bishop of Winchester, twice chancellor of England; founded Winchester School and New College in Oxford.
**William and Mary, The College of.** At Williamsburg, Va.; state institution for men; founded 1693; granted coat of arms 1694 by College of Heralds, London; associated with early political and social life of Virginia; academic courses.
**William Henry, Fort.** *See in Index* **Fort William Henry.**
**William Jewell College.** At Liberty, Mo.; men, Bapt.; founded 1849 (opened 1850); liberal arts, elocution, oratory, music, theology.
**Williams, Sir George** (1821–1905), Eng. merchant, founder (1844) of Y.M.C.A.; **3832.**
**Williams, J. R.,** Amer. inventor, **804.**
**Williams, John Sharp** (born 1854). Amer. Democratic political leader, b. Memphis, Tenn.; U.S. representative from Mississippi 1893–1909; senator after 1911.
**Williams, Roger** (1604?–84), founder of Rhode Island, **3742, 3009.**
**Williams Bay,** Wis., village in s.e. of state about 22 mi. s.e. of Janesville; pop. 436; Yerkes Observatory, **2552,** *picture,* **2551.**
**Williamsburg,** N.Y., town united with Brooklyn in 1855, **515;** bridge, **506.**
**Williamsburg,** Va., seat of the College of William and Mary, 48 mi. s.e. of Richmond; pop. 2500; former cap. of Virginia, **1861.**
**Williams College,** at Williamstown, Mass.; men, non-sect.; incorporated as college 1793 (opened 1791); arts and science; **2170;** Garfield, **1398.**
**Williamsport,** Pa. City on w. branch of Susquehanna R. 70 mi. n.w. of Harrisburg; pop. 36,198; iron and steel products, furniture, rubber goods, paper boxes, silk; formerly noted as lumber center.
**Williamstown,** Mass. Town on Hoosac and Green rivers 5 mi. w. of North Adams; pop. 3707; Williams College.
**Wil'librod** or **Willibrord, Saint** (657?–738?), Eng. missionary to the Frisians, **3612.**
**Williman'tic,** Conn., city 25 mi. e. of Hartford on Willimantic and Natchaug rivers; pop. 12,330; **863.**
**Willis, Nathaniel Parker** (1806–67), Amer. author, most popular journalist of his day, **112.**
**Will-o'-the-wisp** or *ignis fatuus,* **3742.**
**Willow,** 3742–3; classified, **3533;** catkins and feathered seeds, **3534;** "farthest north" among trees, **3533;** flowers, **3534;** leaf, **3535–6.**
**Willow beauty,** a moth, *picture,* **1785.**
**Willow-herb,** a tall plant with willow-like leaves and bunched flowers; pollen grain, *picture,* **1309.**
**Will's Coffee House,** in London, **1043.**
**Wil'mington,** Calif., suburb of Los Angeles, **2062.**
**Wilmington,** Del., largest city and chief mfg. center on Delaware R.; pop. 110,168; **3743, 987;** founded by Swedes, **989.**
**Wilmington,** N.C., seaport on Cape Fear R. 10 mi. from ocean; pop. 33,372; exports lumber, rice, cotton, ships, fertilizers, packing house and cotton products; **2520;** taken in Civil War, **2884;** Venus's fly-trap, **3626.**
**Wilmington Notch,** N.Y., *picture,* **2481.**
**Wilmot, David** (1814–68), Amer. jurist and political leader, **2872.**
**Wilmot Proviso,** 2872.
**Wilson, Alexander** (1766–1813). Amer. ornithologist and artist, b. Paisley, Scotland ('American Ornithology, pioneer work.
**Wilson, Sir Daniel** (1816–92). Canadian educator and archeologist; pres. of Toronto Univ. and leader of successful fight for undenominational univ. education.
**Wilson, Henry** (1812–75), Amer. statesman, b. Farmington, N.H.; known as the "Natick Cobbler" from early occupation; active opponent of slavery; senator from Massachusetts 1855–73; vice-president, **1499.**
**Wilson, Henry Braid** (born 1861). Vice-admiral U.S. Navy; b. Camden, N.J.; served in Span.-Amer. War; in World War commander patrol force, Atlantic Fleet (1917–18) and afterward commander U.S. naval forces in France.
**Wilson, James** (1742–98), Amer. jurist, b. in Scotland; signer of Declaration of Independence 1776, member Constitutional Convention 1787, associate justice of U.S. Supreme Court 1789–98; **3593.**
**Wilson, John** (1785–1854). Scotch author, the famous "Christopher North" of *Blackwood's Magazine* ('Noctes Ambrosianae').
**Wilson, Joseph Ruggles,** father of Woodrow Wilson, **3744.**
**Wilson, Woodrow** (born 1856), 28th president of the U.S., **3744–9;** early life, **3744;** quoted, **2087, 3545, 3571, 3601;** nomination and election (1912), **3744–5, 3429, 3062.** —*Administrations,* **3746–9;** legislation, **3746, 1224, 1230, 1741, 3219, 3437;** Bryan arbitration treaties. **520;** relations with Mexico, **3746, 2217–8;** Panama Canal opened, **2658, 2662;** relations with warring powers, **3746–7, 3798–3800, 437;** re-elected (1916), **3747, 1693, 3062;** war declared against Germany and Austria, **3747, 3800–1;** war policies and measures. **3748, 3801–3;** pope's peace move, **382;** "Self-determination" plea, **2308;** U.S. operations in France, **3803–6;** Fourteen Points, **3748, 3808;** peace settlement, **3748–9, 3808;** League of Nations, **1974;** prohibition adopted, **2921;** woman suffrage, **3778;** immigration law, **1738;** Treaty of Versailles rejected, **3749, 3812;** presidential campaign (1920), **3749, 3812, 1580.**
**Wilson,** N.C. City 40 mi. s.e. of Raleigh; pop. 10,612; tobacco market; cotton, tobacco, and lumber products, carriages, foundry products, machinery.
**Wilson College.** At Chambersburg, Pa.; Presb. institution for women; opened 1870 (chartered 1869); arts and science.
**Wilson-Gorman** or **Wilson Bill,** Democratic measure for tariff reduction, framed chiefly by Representative W. L. Wilson and Senator A. P. Gorman, **790.**
**Wilson's Creek.** Small r. near Springfield, Mo., where, Aug. 10, 1861, Confederates under Gen. McCulloch defeated Federals under Gen. Lyon, who was killed in the battle.
**Wilson's snipe** or **jacksnipe, 3261.**
**Wilson's thrush, 3494.**
**Wilt,** fungus pest of cotton, **906.**
**Wilton,** England. Town in Wiltshire 24 mi. n.w. of Southampton; makes carpets; pop. 2000; Sir Philip Sydney, Holbein, Van Dyck, and Ben Jonson are associated with Wilton House near by, where also, it is said, Shakespeare and his company played before James I (1603).
**Wilton carpet, 3080,** *picture,* **3078.**
**Wilt'shire.** County of s.-cent. England; 1375 sq. mi.; pop. 280,000; pastures, iron mines, large r.r. shops, carpet factories; cap. Salisbury.
**Wim'bledon,** England. A residential suburb of London; pop. 63,000; supposed scene of defeat of King Ethelbert of Kent by King Ceawlin of Wessex (586); famous tennis courts scene of many international matches.
**Wimshurst, James** (1832–1903), Eng. engineer; invented static electricity machine, **1112.**
**Win'chell, Alexander** (1824–91). Amer. geologist, b. North East, N.Y. ('Sketches of Creation'; 'The Doctrine of Evolution'); his writings and lectures greatly popularized modern science and he was one of the early supporters of the evolution theory.
**Winchester,** England. City, educational center 62 mi. s.w. of London; pop. 24,000; 11th cent. cathedral with tombs of William Rufus, Isaak Walton; cap. of Wessex, residence of early Eng. kings; famous for trade and woolen mfrs. in 14th cent.
**Winchester,** Mass. Residential town 8 mi. n.w. of Boston; pop. 10,485; watch hands, leather and felt goods, machine-shop products; contains part of Middlesex Fells, state park.
**Winchester,** Va., city 66 mi. n.w. of Washington; pop. 6883; headquarters of Washington (1755); Civil War battle, **3204–5, 1610.**
**Winchester bushel, 3714, 3715.**
**Wind.** *See in Index* **Winds.**
**Windau** (*vĭn'dou*) or **Vindava,** Baltic port and resort in Latvia, 100 mi. n.w. of Riga; pop. 15,000; exports timber and grain; **1969.**
**Wind Cave National Park,** in s.w. South Dakota near Hot Springs, on slope of Black Hills, **3296,** *map,* **2400.**
**Windermere, Lake,** England, on w. border of Westmorland (in s.e. part of Lake District); largest lake in England, **1160,** *map,* **1159,** *picture,* **1158.**
**Wind instruments, 2381, 2383,** *picture,* **2382;** horns, **1680–1;** in orchestra, **2590–1;** organ, **2598–2600.**
**Windischgrätz** (*vĭn'dish-grĕts*), **Prince Alfred** (1787–1862), Austrian field-marshal; served in Napoleonic Wars; **1354.**
**Windmills, 3749;** an air turbine, **3554;** in Belgium, *picture,* **372;** in Holland, **1827,** *pictures,* **2438, 2442.**
**Wind motor, 3749.**
**Win'dom, William** (1827–91). Amer. financier and statesman, b. Waterford, Ohio; one of earliest exponents of the gold standard; sec. of treasury 1881–89 under Garfield and Harrison.
**Windows,** glass for, **1471–2;** stained glass, **1474, 184.**
**Windpipe.** Same as **Trachea.**
**Wind River Mts.,** in w.-cent. Wyoming, **3036,** *map,* **3820.**
**Winds, 3750–1, 3366–7;** affect Atlantic Ocean currents, **255;** affect climate, **794, 795, 606, 1188, 3588;** anemometer measures, **3708,** *picture,* **3709;** chinooks, **512, 82;** cyclones, **944;** dew formation, **1000;**

effect on aviation, *picture*, **58**; fogs, **1316**; forests damaged, **1328**; in Gk. myth., **767**; monsoons, **1746–7, 2765**; oceanic winds, **1188**; and rainfall, **2972–3**; storms, **3366**; typhoons, **3366, 2765**; westerlies in U.S., **3588**.
**Windsor,** Conn. Mfg. town 6 mi. n. of Hartford; pop. 5620; in 1639 united with Hartford and Wethersfield under "Fundamental Orders" to form colony of Connecticut.
**Windsor,** England, old town near London; pop. 15,000; **3751–2**.
**Windsor,** Ontario, industrial and r.r. city on Detroit R. opposite Detroit; pop. 39,000; automobiles and accessories, salt, chemicals, drugs; Canadian branches of many U.S. mfg. companies; King's College; train ferry to Detroit, *picture*, **2970**.
**Windsor, House of, 1430.** *See also in Index* **Hanover, House of.**
**Windsor Castle, 3751–2,** *picture*, **1154**.
**Windward Islands,** Brit. group forming part of Lesser Antilles, W. Indies, *map*, **2514–5**.
**Wine, 84, 1502;** France, **466, 1346,** *picture*, **1350;** Spain, **3302;** vinegar made from, **3644**.
**Winged Bull** (Assyrian), *picture*, **3155**.
**'Winged Victory',** celebrated Gk. statue, **1532**.
**Wingless Victory, Temple of,** *picture*, **250**.
**Wings,** of animals, **1572, 1787;** armored forms in beetles, **1787, 366–7;** of birds, **401;** of flies, **1787, 1313;** of moths and butterflies, **544, 546,** *picture*, **546;** in prehistoric birds and reptiles, **134–8,** *picture*, **401;** as sense organ in bats, **345**.
**Wingweed,** a seaweed, *picture*, **3170**.
**Winkelried** (*vĭn'kĕl-rēt*), **Arnold,** Swiss hero, **3752**.
**Winkle** or **periwinkle,** a mollusk, **3256, 2281**.
**Winnebago** (*wĭn-ĕ-bā'gō*), **Lake,** largest inland lake in Wisconsin, **3768, 3772**.
**Winnebagoes,** tribe of N. Amer. Indians formerly residing in cent. Wisconsin; initiation of medicine man, *pictures*, **1773**.
**Winnemuck'a,** Piute chief, **2447–8**.
**Winnepesaukee** (*wĭn-ĕ-pĕ-są'kē*), **Lake,** N.H., **2454**.
**Win'nipeg,** Canada, cap. of Manitoba, at junction of Red and Assiniboine rivers; pop. 225,000; **3752, 2137,** *picture*, **609;** Red R. rebellion, **2986**.
**Winnipeg, Lake,** Manitoba; 8555 sq. mi.; length 260 mi.; drained by Nelson R. into Hudson Bay, **2136, 2986,** *maps*, **616, 602–3**.
**Winnipego'sis, Lake,** a lake of Manitoba, Canada, w. of L. Winnipeg; 2000 sq. mi.; *map*, **602–3**.
**Winnipeg River,** Manitoba, flows 200 mi. from L. of the Woods to L. Winnipeg, **3752**.
**Wino'na,** Minn., port on Mississippi R. 105 mi. s.e. of St. Paul; pop. 19,143; flour, lumber, packed meat, candy, pickles, agricultural implements; r.r. shops; grain, lumber, live stock trade; College of St. Teresa; **2256, 911**.
**Winslow, Allen B.,** Amer. inventor, **3187**.
**Winslow, Edward** (1595–1655). One of founders of Plymouth colony; governor at intervals 1633–45.
**Winslow, John Ancrum** (1811–73). Amer. admiral, b. Wilmington, N. C.; commander of the *Kearsarge* when it sank the Confederate privateer *Alabama* (1864).
**Winsor, Justin** (1831–97). Amer. historian, b. Boston ('Narrative and Critical History of America').
**Winston-Salem,** N.C., largest city of state; pop. 48,395; important tobacco-mfg. center; chemicals, iron products, flour, furniture, cotton and knit goods; **2519, 2520**.
**Winter, William** (1836–1917). Amer. poet, essayist, and dramatic critic ('Thistledown'; 'Gray Days and Gold'; 'Life and Art of Edwin Booth').
**Winter,** how caused, *picture*, **1063;** festivals, **758, 1031, 1673;** hibernation of animals, **1646–7;** nature study in, **2413, 3538–9;** solstice, **1173**.
**Wintergreen,** a creeping evergreen plant, **3752;** belongs to heath family, **915**.
**Winter Palace,** Petrograd, **2748**.
**Winter solstice, 1173.**
**Winter sports, 3753–6;** in Norway, **2530,** *picture*, **2532;** in Sweden, **3401–2;** in Switzerland, **3416, 3421,** *picture*, **3413;** in White Mts., **2454**.
**'Winter's Tale',** comedy by Shakespeare, **3756–7;** quotations from, **3194**.
**Winterthur** (*vĭn'tĕr-tụr*), Switzerland. Town 12 mi. n.e. of Zurich on Eulach R.; pop. 27,000; cambric, printed cotton, machinery; vineyards.
**Winter wheat, 3730,** *picture*, **3731**.
**Winthrop, John** (1588–1649), first gov. of Massachusetts Colony, **3757, 321;** as author, **111**.
**Winthrop, John** (1606–76), son of preceding; gov. of Connecticut most of period 1657–76; obtains charter, **868**.
**Winthrop,** Mass., residential suburb and popular beach resort on Massachusetts Bay n.e. of Boston; pop. 15,455; **472**.
**Winton, Alexander** (born 1860), Amer. inventor and automobile manufacturer, b. Scotland; pioneer in auto industry, **276**.
**Wire, 3757–8;** aluminum, **104;** gold and silver, **1482;** made into pins, **2807,** needles, **2433–4;** platinum, **2831;** tungsten, **3548;** wire nails, **2387, 2388**.
**Wire-glass, 1472.**
**Wireless telegraph and telephone, 3758–67;** audions, **257, 3766,** *pictures*, **3759, 3761;** damped and undamped waves, **3762;** Marconi's work, **3760–1, 2145–6;** preliminary discoveries by Maxwell and Hertz, **3760, 3766, 1122;** receiving, **3760–1, 3766;** transmitting, **3760–1;** tuning, **3762**.
**Wire-worm,** larva of the click-beetle, **369**.
**Wirt** (*wĕrt*), **William** (1772–1834), Amer. lawyer, statesman, and author, assistant in prosecution of Aaron Burr; U.S. atty.-gen. 1817–29 ('Life of Patrick Henry').
**Wirt, William A.** (born 1874), Amer. educator, b. Markle, Ind.; "Gary" plan of education, **1402**.
**Wirz, Henry** (d. 1865), Confederate captain in charge of Andersonville prison, **781**.
**Wiscon'sin,** a n.-cent. state of U.S.; 56,066 sq. mi.; pop. 2,632,067; cap. Madison; **3768–73,** *maps*, **3770, 3584–5;** apprenticeship law, **3655;** education, **3770, 3771, 3141;** meaning of name, **3768;** Milwaukee, **2246–7;** products and resources, **3770–2;** state flower, **3347;** surface features, **3768, 3770.** —*History*, **3772–3;** Marquette's explorations, **2151,** Clark's expedition, **783;** in Northwest Territory, **2529;** Milwaukee settled, **2247**.
**Wisconsin, University of,** at Madison, Wis.; co-ed. state institution; organized 1848 (chartered 1838); colleges of letters and science, agriculture, engineering; also medical, law, and graduate schools; fine library, including State Historical Library; **3770, 3771,** *picture*, **3773**.
**"Wisconsin idea," 3771.**
**Wisconsin River,** flows s. about 400 mi. through center of Wisconsin into Mississippi R., **3768, 3772,** *map*, **3770;** Dells, **3770,** *picture*, **3771;** Marquette and Joliet discover, **2151**.
**'Wisdom of Solomon',** apocryphal book of Old Testament, **390**.
**Wisdom teeth, 3452.**
**Wise, Henry Alexander** (1806–76). Amer. statesman, b. Drummondtown, Va.; gov. of Virginia 1856–60; one of last acts of his term was to sign John Brown's death warrant.
**Wise, Isaac Mayer** (1819–1900). Amer. Jewish rabbi and educator, b. in Bohemia; leader of Reformed Judaism in U. S.; president of Hebrew Union College, Cincinnati.
**Wise, Stephen Samuel** (born 1872). Amer. Jewish rabbi, b. Budapest, Hungary; after 1907 rabbi of Free Synagogue, New York; widely known as an eloquent preacher, publicist, and leader in social welfare work.
**Wiseman, Nicholas** (1802–65). English Rom. Cath. prelate, created cardinal and archbishop of Westminster (1850), the first to hold this title after the restoration of the hierarchy in England; his ability and moderation tempered the storm raised by the assumption of territorial titles.
**Wish'art, George** (1513?–46), Scotch reformer and martyr, converted John Knox; burned for heresy; **1941**.
**"Wishing Seat," 1809.**
**Wis'tar, Caspar** (1761–1818), Amer. physician and anatomist, b. Philadelphia; wrote first book on anatomy published in U.S.; wistaria named for him, **3773**.
**Wistar'ia,** a flowering vine of the bean family, **3773**.
**Wister, Owen** (born 1860). Amer. novelist, b. Philadelphia ('The Virginian'; 'Lady Baltimore'; 'Members of the Family'; 'The Pentecost of Calamity').
**Witchcraft, 3773–4, 2120.** *See also in Index* **Magic; Superstitions.**
**Witch-hazel** or **wich hazel,** a shrub or the liquid distilled from it, **3774**; classified, **3533**; twigs as divining rods, **1611**.
**Witenagemot** (*wĭt'ĕ-nä-gĕ-mōt*), old Anglo-Saxon assembly, **2687**.
**Wither, George** (1588–1667), Eng. lyric poet ('Shepherd's Hunting'; 'Songs of the Old Testament'; 'Psalms of David'), **1164**.
**Witherspoon, John** (1722–94). Scotch Presbyterian clergyman; came to Amer. colonies 1768 to become pres. of Princeton College, which position he held until his death; member N.J. constitutional convention 1776, signer Declaration of Independence and Articles of Confederation.
**Witt** (*vit*), **M.,** Ger. astronomer, **237**.
**Witte** (*vĭt'ĕ*), **Sergei Julievitch** (1849–1915). Rus. liberal statesman, chief Russian negotiator of peace with Japan 1905, and first Russian prime minister 1905–06; struggled to free Russia from economic foreign bondage.
**Wittekind** (d. 807?). Most celebrated leader of the Saxons against Charlemagne; fought Franks for 8 years, but finally accepted Christianity in 785.
**Wittelsbach** (*vĭt'tĕls-bäĸ*), **House of,** family which ruled Bavaria for a century as kings and for 7 centuries previous as counts or dukes, **347**.
**Wittenberg** (*vĭt'ĕn-bĕrG*), Germany, town on Elbe R. 58 mi. s.w. of Berlin; pop. 23,000; textiles, machinery; home of Luther and cradle of Reformation; univ. incorporated with Halle 1817; tombs of Luther and Melanchthon; **3132;** Luther, **2084, 2085**.
**Wittenberg College.** At Springfield, Ohio; Lutheran, co-ed.; founded 1845; liberal arts, elocution, music, art, theology.
**Witwatersrand** (*vĭt'vä-tĕrz-ränt*), gold-mining dist. in S. Africa, **3526, 1479, 3281, 1895,** *pictures*, **3281, 1481**.

**Wiz'ard,** a magician, **2120.**
**Woad** (*wōd*), a mustard-like plant yielding blue dye; early Britons used, **1157;** supplanted by indigo, **1050.**
**Wo'burn,** Mass., city 10 mi. n.w. of Boston; pop. 16,574; chemicals, leather, machinery, glue; **2166.**
**Wo'den.** Same as **Odin.**
**Wof'fington, "Peg"** (1714?–60). Celebrated Irish actress, heroine of Reade's 'Peg Woffington'.
**Wofford College.** At Spartanburg, S.C.; Meth. Episc., men; opened 1854 (chartered 1852); arts and science.
**Wohlgemuth** (*vōl'gē-mut*), **Michael** (1434–1519), Ger. painter; works in Nuremberg, **2543.**
**Wolf,** a dog-like wild animal, **3774–5;** dog a descendant, **1018;** fur, **1390, 3528;** in India, **1748.**
**Wolf, Tasmanian,** a striped carnivorous marsupial of Australasia, **3439, 1908.**
**Wolfe, James** (1727–59), Brit. soldier, hero of Quebec, **3775;** monument, **2949, 2312.**
**Wolfenbüttel** (*vōl'fĕn-büt-ĕl*). Town of Germany 7 mi. s. of Brunswick; pop. 18,000; defeat of Austrians by Swedes in Thirty Years' War, June 1641.
**Wolff** (*vōlf*), **Kaspar Friedrich** (1733–94), Ger. embryologist, lived in Petrograd after 1766; first to advance modern "cell theory" of embryology, **1141.**
**Wolf-fish.** A large carnivorous fish of coasts of Europe and N. Amer.; great interlocking front teeth give wolfish appearance; bites savagely when caught.
**Wolfhound, Russian, 1021,** *picture,* **1023.**
**Wolf'ramite,** a tungsten ore, **3548;** in Bolivia, **450;** in Peru, **3289.**
**Wolfram von Eschenbach** (*vōlf'räm fŏn ĕsh'ĕn-bäĸ*) (1170–1220), Ger. minnesinger, greatest of Middle High Ger. epic poets; chief works; **1438.**
**Wolf's bane,** a species of aconite plant, **2855.**
**Wolf spider,** a hairy running spider, **3325;** carrying young, *picture,* **3324.**
**'Wolf-Wind and the Children',** an Indian legend, **611–5.**
**Wol'laston, William H.** (1766–1828). Eng. chemist, first discoverer of "Fraunhofer's lines"; discovered palladium and rhodium; invented camera lucida.
**Wollaston Lake,** Saskatchewan, **3128.**
**Woll'stonecraft, Mary.** *See in Index* **Godwin.**
**Wolseley** (*wụlz'lĭ*), **Garnet Joseph, Viscount** (1833–1913), field marshal and commander-in-chief of Brit. army 1885–1900; leader of Red River expedition **2986.**
**Wol'sey, Sarah Chauncey.** *See in Index* **Coolidge, Susan.**
**Wolsey, Thomas** (1475?–1530), Eng. cardinal and statesman, **3775–6, 1636;** London residence, **2053;** Hampton Court, *picture,* **1154.**
**Wol'verhampton.** Mfg. town of Staffordshire, England, 13 mi. n.w. of Birmingham; pop. 103,000; tin plate, japanned goods, enameled ware, various iron products.
**Wolverine',** a bearlike animal of the weasel family, **3776.**
**Wolverine State, 2223.**
**Woman's Christian Temperance Union, 3777;** Frances E. Willard, **3737.**
**Woman's Relief Corps, 2695.**
**Woman suffrage.** *See in Index* **Women's rights.**
**Wom'bat,** a small bearlike marsupial, **1908, 266;** altitude range, *picture,* **397.**
**Women:** in anc. Athens, **1524;** among Aztecs, **290;** in anc. Babylonia, **296;** in Burma, **540, 541;** colleges for, **829;** factory laws, **1218;** foot-binding in China, **742,** *picture,* **744;** in India, **1751,** *picture,* **1748;** in Madagascar, **2106;** among Maoris, **2499;** in Mohammedan countries, **2276, 2736, 3559–60;** among N. Amer. Indians, **1768, 343;** nursing as a profession, **2544;** among Russian peasants, **3087;** ratio to total world population, **2881;** as warriors, **106.**
**Women's clubs, 3777.**
**Women's rights, 3777–9;** Susan B. Anthony, **146, 149;** Frances Willard, **3737.**
**Wonderberry,** cross between raspberry and dewberry, **538.**
**Wood, Fernando** (1812–81), Amer. politician, b. Philadelphia; mayor of New York 1854–61; **2498.**
**Wood, Leonard** (born 1860), Amer. general, b. Winchester, N.H.; colonel of "Rough Riders" in Span.-Amer. War, military gov.-gen. of Cuba 1899–1902; commanding general in Philippines 1906–08, and civil gov. of Philippines since 1921; quells Sulu uprising, **2766.**
**Wood,** the stiffening tissue in tree trunks and branches, **3530–2;** for airplane parts, **2124, 3333;** baskets and boxes, **399;** bats and clubs, **3743, 3251;** bows, **3830;** building timber, **365, 719, 1186, 3176, 3424, 3667;** cask staves, **2548;** charcoal, **688;** combustion, how it produces heat, **1619;** creosote as preservative, **151;** durability under water, **365, 1139, 1186, 3743;** fireproofing, **1263;** fuel, **399, 597, 719, 2135, 3176;** furniture and cabinet work, **1385, 399, 548, 719, 946, 1073, 1903, 2124–5, 2138, 2580, 3424, 3451, 3667;** gun stocks, **548, 3667;** handles, **225, 3251, 3743;** paint as preservative, **2642;** paper pulp, **523, 3333, 3743;** pencils, **1903, 2712;** ships and ship parts, **2548, 3332, 3451;** ties and posts, **719, 946, 3176;** trestles and wharves, **512, 2135, 3176;** U.S. annual cut, **3590.**
**Wood** or **methyl alcohol, 84.**
**Wood ant,** a forest-dwelling ant, *picture,* **1782.**
**Woodberry, George Edward** (born 1855). Amer. critic and poet, b. Beverly, Mass. ('The Inspiration of Poetry'; 'The Appreciation of Literature').
**Woodbine,** the honeysuckle vine, **1678.**
**Woodbine, American,** the Virginia creeper, **3651;** distinguished from poison ivy, **2852.**
**Wood block pavements, 3027.**
**Woodchuck** or **ground hog,** a burrowing rodent, **1543;** hibernation, **1646–7.**
**Woodcock,** a game bird of the snipe family, **3779–80, 3261,** *picture,* **411;** altitude range, *picture,* **397;** courtship, **405;** protective coloration, **2924.**
**Wood-duck, 1044–5.**
**Wood-engravings** or **wood-cuts, 1168;** Japanese, **1876,** *picture,* **1875.**
**'Wooden Horse, Story of the', 3543–4.**
**Wood ibis,** an Amer. stork, **3362, 3365.**
**Woodpecker, 3780–1,** *pictures,* **416;** courtship, **405;** feet, *pictures,* **409;** female brightly colored, **411;** how he got his red crest (Indian legend), **2059;** nest in cacti, **562;** tongue, **3513.**
**Wood pewee,** a small flycatcher, **1313–4;** camouflaged nest, **406.**
**Wood pigeon,** an Amer. wild pigeon, now extinct, **2803.**
**Wood pulp, 2667–73.**
**Wood rat, 2977.**
**Wood River,** small stream of Alaska emptying into Bristol Bay, famous for salmon, **3113.**
**Woodrow, Thomas,** grandfather of Woodrow Wilson, **3744.**
**Woodruff, Wilford** (1807–98), Amer. Mormon leader, **2327.**
**Wood sorrel,** an oxalis with small white flowers and acid leaves, **2607;** explosive seed-pods, **3171.**
**Wood'stock,** England. Town 8 mi. n.w. of Oxford; formerly a royal residence; associated with Henry II and "Fair Rosamund"; Elizabeth was imprisoned here by Mary; near by is Blenheim Park.
**Woodstock,** Ontario. City and summer resort on Thames R. 80 mi. s.w. of Toronto; pop. 10,000; farm trade; large tanneries.
**Wood stork,** an Amer. bird, **3362.**
**Wood tar,** dark liquid distilled from wood, **3436.**
**Wood-thrush,** an Amer. bird, **3494;** camouflaged nest, **406.**
**Wood warblers,** *picture,* **420.**
**Wood-wind instruments, 3781, 2590–1.**
**Wood-working machinery, 3514–6,** *pictures,* **1386–7.**
**Woof,** in weaving, **3326, 904.**
**Wool, 3782–7;** alpaca, **100;** bleaching, **435;** best breeds of sheep, **3200;** chief U.S. market, **472;** fabrics, **804;** felt, **1231;** fiber, *picture,* **1560;** llama, **2039;** why it keeps heat in, **1619.** *See also in Index* **Sheep; Spinning and weaving.**
**Woolly bear,** a caterpillar, **661.**
**Woolly** or **hairy rhinoceros,** an extinct species, common in Europe during the Ice Age, *picture,* **667.**
**Woolman, John** (1720–72), Amer. Quaker preacher and social reformer; 'Journal', **112.**
**Wool'ner, Thomas** (1825–92). Eng. sculptor and poet, one of Pre-Raphaelites.
**Woolsey, Theodore Wright** (1801–89). Amer. educator and author, b. New York City; pres. of Yale 1846–71.
**Woolson, Constance Fenimore** (1848–94). An Amer. novelist, b. Claremont, N.H.; grandniece of James Fenimore Cooper ('Castle Nowhere'; 'Horace Chase').
**Woolwich** (*wul'ich*), England, metropolitan borough of London on Thames R.; pop. 140,000; chief arsenal of Gt. Brit.; govt. college for engineering and artillery; **2056.**
**Woolworth, Frank W.** (1852–1919). Amer. merchant; out of the profits of his chain of about 1000 five and ten cent stores built the Woolworth Building, New York City.
**Woolworth Building,** the highest building in world, **2489.**
**Woonsock'et,** R.I., center for woolen, cotton, and other mfrs. on Blackstone R. 12 mi. n. of Providence; pop. 43,496; **3010.**
**Woos'ter,** Ohio. Mfg. and trade center 50 mi. s.w. of Cleveland; pop. 8204.
**Wooster, College of.** At Wooster, Ohio; co-ed.; founded 1866 by Presbyterians; arts and science, music, Bible and missionary training school.
**Worcester** (*wụs'tēr*), England, cap. of Worcestershire on Severn R. 25 mi. s.w. of Birmingham; pop. 50,000; battle (1651), **694;** gloves, **1475;** pottery, **2883.**
**Worcester,** Mass., 2d largest city of state, 44 mi. w. of Boston; pop. 179,754; **3787, 2166.**
**Worcester College,** Oxford, founded, **2610.**
**Worcester Polytechnic Institute.** At Worcester, Mass.; men; chartered 1865 (opened 1868); mechanical, civil, and electrical engineering, chemistry, general science.
**Worcestershire** (*wụs'tēr-shēr*). A midland county of England; 751 sq. mi.; pop. 406,000; cap. Worcester.
**Wor'den, John Lorimer** (1818–97). Amer. admiral, commander (when lieutenant) of the *Monitor* during its fight with the *Merrimac.*
**Words,** study of, **2770–2.**
**Wordsworth, Dorothy** (1771–1855). Eng. writer, sister of William Wordsworth ('Journal').
**Wordsworth, William** (1770–1850), Eng. poet, **3788, 1166;** friendship with Coleridge, **825, 826.**

**Work, Hubert** (born 1860). Amer. physician and political leader; postmaster-general in Harding's administration, b. Marion Center, Pa.
**Work.** In physics, moving an object against resistance; measured by multiplying weight by distance moved. *See in Index* **Mechanics; Power.**
**Worker bee,** 359–60, 362, *pictures,* 360, 361.
**Workmen's Compensation Acts,** 1145, 1792.
**World languages,** 1177; Latin, 1965.
**"World must be made safe for democracy,"** 3800.
**World's Columbian Exposition,** at Chicago (1893), 791, 724, 770.
**World's fairs,** 1220.
**World War** (1914–18), 3789–3812; chief events summarized, 1662; airplanes, 58, 60, *picture,* 61; balloons, 314–20, 1629; blockade and embargo, 1140, 437; Boy Scouts' work, 479–80; camouflage, 591; cannon developed, 633–4, 636; carrier pigeons, 2804; conscription, 218, 466, 3801–2; cost in lives and property, 3789, 3809, 3748, 1156, 1353; dogs used, 1018–9; gas warfare, 1408; international law, 1794, 1559, 437; motor transport, 274–5, *picture,* 276; oils and fats, 1225; potash, 2898, 2900; shipping, 3219; slang words coined, 3248; socialists' attitude, 3269; star shells, 1266; tanks, 3433.
*Causes and preliminary events,* 1196, 3789–90; assassination of Francis Ferdinand, 1354; Austria's Balkan policy, 1354, 310, 468, 3177; colonial rivalry, 837; Ger. ambitions in Asia Minor, 234; Ger. militarism, 1449, 3738; Rus. situation, 3094, 2506.
*Leaders:* Beatty, 355–6; Borden, 466–7; Botha', 475; Clémenceau, 786–7, 789; Currie, 940–1; Foch, 1315; Haig, 1559; Hindenburg, 1650–1; Hoover, 1679; Sir Sam Hughes, 1693; Joffre, 1894–5; Kitchener, 1930; Lloyd George, 2040–1; Ludendorff, 2076; March, 2145; Cardinal Mercier, 2199; Pershing, 2733; Poincaré, 2851–2; Sims, 3243; Smuts, 3254; Venizelos, 3625–6; President Wilson, 3746–9.
*Events on Western Front,* 3791–4, 3797, 3804–6; Aisne, battles of, 69; Antwerp occupied, 152; Argonne, 193–4; Arras, 220; Belgium devastated, 376, 2199, 520, 2073; Belleau Wood, 2149; Cantigny, 638; Château-Thierry, 699; Dunkirk important objective, 1048; Fr. cities devastated, 1353, 2992–3, 2008, 1995; Luxemburg's neutrality violated, 2086; Marne, battles of, 2150–1, 1895; Saint-Mihiel, 3110; Somme, 3275; Verdun, 3629; Vimy Ridge, 220; Ypres, 3834.
*Other military events and campaigns:* in Arabia, 166; Armenian massacres, 213, 3796; Gallipoli, 3795, 963, 3810; Ital. front, 1840, 3795, 3797–8, 3807, 3539; Japan captures Kiaochow, 1870; in Mesopotamia, 3795, 3798, 305; Palestine and Syria, 2643, 2645, 3798, 3807; Poland devastated, 2858; Rumania crushed, 3795, 3080, 523; Rus. front, 3794, 3798, 1650, 3673; Saloniki campaign, 2097; Serbian campaigns, 3794–5, 3806–7, 2313, 377; in S. and E. Africa, 3796, 3254, 1068, 1069.
*Naval operations,* 3796, 3799–3800, 2422–4; in Baltic, 321; Dardanelles, 963; Helgoland, 1629; Dogger Bank (1915), 3810; *Emden's* raids, 2423, 3796; Falkland Isls., 1223; Jutland (May 31, 1916), 3796, 2423, 356; *Lusitania* sunk, 3746–7, 3791, 3799; North Sea mine barrage, 3518–20, 2528, 2601; submarine campaigns, 3376–8, 3791, 450, 496; Zeebrugge raid, 520.
*British Empire:* Australia, 269, 2453; Canada, 620, 466, 941, 1693; India, 1754; S. Africa, 3796, 3254, 475.
*United States,* 3798–3804; neutrality, 3746–7, 3798–3800, 437; war declared, 3800–1, 3747; war measures and preparation, 3801–3, 3748; Selective Service Act, 3801–2; Hog Isl. shipyard, 3214, 3216; harbor improvements in France, 466, 502, 3111; rifle used, 1256, *picture,* 1255; Cantigny, 638; Château-Thierry, 699; 2d battle of the Marne, 2151; Saint-Mihiel, 3110; Argonne, 193–4; Navy, 2422–3, 2424; North Sea mine barrage, 3518–20, 2528, 2601; Marine Corps, 2149, 3805; welfare and relief work, 1679, 1935, 2984–6, 3119–20, 3832, 3833; in Peace Conference, 3748–9, 3808; Treaty of Versailles rejected, 3749, 3812; separate treaties with Germany and Austria, 3812, 1582.
*Diplomacy and internal events:* Pius X appeals for peace, 2814; Montenegro goes to aid of Serbia, 2313; Japan enters war, 1870; Turkey joins Central Powers, 3560; Italy joins Allies (May 1915), 3795; Bulgaria's policy, 533; Portugal joins Allies, 2890; Germany aids Irish Easter rebellion, 1811; Rumania joins Allies, 3795, 3080; Lloyd George becomes Eng. premier, 2040; Wilson proposes "Peace without Victory," 3747; Germany announces unrestricted submarine warfare (Jan. 1917), 3747; "Zimmerman note," 2218, 3747, 3800; U.S. declares war (Apr. 6, 1917), 3800–1, 3747; Brazil declares war, 496; China joins Allies, 748; Venizelos secures Gk. coöperation with Allies, 3625, 1526; Rus. revolution; 3094–6, 3084, 3798, 213, 1986; Benedict XV proposes peace, 382; President Wilson lays down "Fourteen Points" (Jan. 1918), 3748, 3808; Brest-Litovsk Treaty (March 3, 1918), 3798, 3096; independence of Czecho-Slovakia recognized, 948; Turkey and Bulgaria sign armistice, 3806, 3807; Austria granted armistice, 3807; William II abdicates, 3738; Germany granted armistice (Nov. 11, 1918), 3808, 213; kingdom of Jugo-Slavia proclaimed, 3176.
*Results and peace settlement,* 3808, 3811–2, 3748–9, 1662; Australia, 269, 1072; Austria-Hungary, 3807–8, 3811–2, 3642, 3539, 273; Brit. Empire, 513; Bulgaria, 533, 3812; China, 3195–6, 3812, 1870; Czecho-Slovakia created, 947–8, 1703; Danzig, 962; Dardanelles internationalized, 963, 3560, 3807; Denmark, 997; Esthonia independent, 1180; Finland independent, 1248; Fiume dispute, 1286, 3812; France, 1353–4, 3811, 3426, 103; Germany, 1444–5, 3809, 3811, 513; Greece, 3626, 1526, 26; Hungary, 1702, 1703, 3080; inflation of currency, 2282; Italy, 1840, 3539–40, 3574, 1286, *map,* 1836; Japan, 1870, 3195–6, 3812, 3229, 2624; Jugo-Slavia formed, 1901, 2313, 1703, 2097, 1286; Latvia independent, 1969; League of Nations established, 1974, 3808; Lithuania independent, 2030, Mesopotamia, 2201; national debts, 2399; New Zealand, 513, 2500; Palestine, 2646–7, 1886; Poland, 2856–7, 2859, 3812, 962, 948; Rumania, 3080, 3812; Russia, 3084–5, 2749, 3229, 3575; S. Africa, 3283; Norway, 2534; Syria, 3426, 3812; Turkish Empire, 3557, 3560, 3812, 1526.
**Worm gear,** automobile, *picture,* 280.
**Worms,** Germany. Mfg. and trade town 25 mi. s. of Mainz on Rhine R.; pop. 45,000; 11th cent. cathedral; one of chief Ger. cities in Middle Ages, frequently a royal residence; scene of many historic events.
**Worms,** 3813–4, 3945; centipedes distinguished, 679; earthworm, 1066–8, 2998; evolutionary position, *diagram,* 128; hookworm, 1679; leeches, 1984–5; method of locomotion, 1322; killed by sprays, 3330; tapeworm, 2678.
**Worms, Concordat of** (1122), 1633.
**Worms, Diet of** (1521), 2084, 2987.
**Worm shell,** *picture,* 3203.
**Worsted goods,** 804, 3787.
**Wort,** in yeast mfr., 3829.
**Worth, Charles Frederick** (1825–95). Fr. dressmaker, b. England; attracted Empress Eugénie's notice and became a world arbiter of women's styles.
**Wot'ton, Sir Henry** (1568–1639). Eng. poet, immortalized by one golden lyric:
"How happy is he born or taught
That serveth not another's will,
Whose armor is his honest thought
And simple truth his highest skill!"
**Wounds,** treatment of, 150; bandaging, 1267–8.
**Wove paper,** 2668.
**Wrangel** (*vräng'čl*), **Peter Nicholaievich, Baron** (born 1879), Ukrainian general, anti-Bolshevik leader; army destroyed, 3812.
**Wrangel Land.** Isl. of Arctic Ocean 400 mi. n.w. of Bering Strait; 70 by 35 mi.; chiefly granite rocks (2000 ft.); claimed by U.S. and Canada.
**Wrangell Mts.** A group of volcanic mts. in s.w. Alaska; highest peak Blackburn (17,140 ft.); inactive since 1819.
**Wren, Sir Christopher** (1632–1723), greatest Eng. architect, designer of St. Paul's Cathedral, 2052, 2056, 3719.
**Wren,** a tiny bird, 3815, *picture,* 419; nest, 423, *pictures,* 425; remarkable feeding record, 402.
**'Wrestlers, The',** Gk. statue, *picture,* 1205.
**Wrestling,** 3815–6.
**Wrexham** (*rĕks'ăm*). Borough of n. Wales, 12 mi. s.w. of Chester; pop. 18,000; famous medieval church; tomb of Elihu Yale, founder of Yale Univ.; iron products, paper, spirits.
**Wright** (*rīt*), **Sir Almroth E.** (born 1861). Eng. surgeon and pathologist whose "opsonin" theory led to anti-typhoid inoculation and use of dead bacterial cultures in other diseases.
**Wright, Carroll Davidson** (1840–1909). Amer. statistician and economist, first U.S. commissioner of labor.
**Wright, Harold Bell** (born 1872). Amer. clergyman and widely popular novelist, b. Rome, N.Y. ('The Shepherd of the Hills').
**Wright, Lemuel W.,** Amer. inventor; pin-making machine, 2807.
**Wright, Orville** (born 1871), Amer. aviator and inventor, b. Dayton, Ohio; with his brother Wilbur (1867–1912) designer of first successful heavier-than-air flying machine; 56–7; their kite, *picture,* 55.
**Wright, Philemon** (1760–1839), founder of Ottawa, Canada, 2605.
**Wriothesley** (*rōts'lĭ*), **Henry.** *See in Index* **Southampton, Henry Wriothesley.**
**Writing,** 3816–7; alphabetic, 100–1; Assyrian clay tablets, *picture,* 297; Braille system, 437; Chinese, 739, 744; Chinese letter-writer, *picture,* 742; civilization, influence on, 773; cuneiform, 939, 294, *picture,* 2739; early materials for, 455; "invisible," 1779; Japanese, 1873; penmanship, 1574; shorthand, 3224–5.
**Wrought iron,** 1820, 1824.
**Wuchang',** China, city adjoining Hankow, 1575.
**Wuchow** (*wų-chou'*), China. Treaty port on Sikiang or West R. 125 mi. w. of Canton; pop. 75,000; distributing point for 3 provinces.
**Wülpelsberg,** peak in n. Switzerland, 1576.
**Wundt** (*vųnt*), **Wilhelm** (1832–1920), Ger. physiologist, psychologist, and philosopher; called creator of

modern experimental psychology; **2931.**
**'Wung Foo's Busy Day'**, story, **749–52.**
**Württemberg** (*vür'tĕm-bĕrĸ*), republic in s.w. Germany, formerly kingdom in Ger. Empire; 7629 sq. mi.; pop. 2,520,000; **1441**; made kingdom by Napoleon, **2395**; king abdicates, **3808.**
**Würzburg** (*vürts'bu̇rĸ*), Germany. City of Bavaria on Main R. 60 mi. s.e. of Frankfort; pop. 87,000; furniture, machinery, spirits, scientific instruments; Würzburg Univ.
**Wu Ting Fang** (born 1842). Chinese scholar, diplomat, and statesman, minister to U.S. and member of the Hague permanent arbitration court.
**Wyalu'sing,** Wis., village in s.e. on Mississippi R., 62 mi. s. of La Crosse; earth mound, **2357.**
**Wy'andot** or **Wyandotte Indians.** Same as **Hurons.**
**Wyandotte,** Mich. City 10 mi. s.w. of Detroit on Detroit R.; pop. 13,851; chemicals, salt, iron products, automobiles, ships.
**Wyandotte,** a breed of fowls, **2911,** *picture,* **2909.**
**Wyandotte Cave,** Ind., great cave in s., 5 mi. n.e. of Leavenworth; noted for number and variety of stalactites and stalagmites; *map,* **1758.**
**Wyandotte Indian cemetery, 1912.**
**Wy'ant, Alexander H.** (1836–92), Amer. painter, **2634.**
**Wy'at** or **Wyatt, Sir Thomas** (1503–42). Eng. poet and statesman, said to have been in love with Anne Boleyn; introduced sonnet into England from Italy; father of Sir Thomas Wyat the Younger (1520–54), who was executed for leading "Wyat's rebellion" to prevent Span. marriage of Queen Mary.
**Wycherley** (*wĭch'ẽr-lĭ*), **William** (1640?–1716), Eng. wit and dramatist, **1036.**
**Wyclif** (*wĭk'lĭf*) or **Wycliffe, John** (about 1320–84), Eng. churchman and reformer, **3817;** Bible translation, **389;** Huss influenced by, **1705;** influence on Eng. language, **1163.**
**Wye** (*wī*). A river rising in s. Wales; flows s.e. into Herefordshire, England, and turns s. entering the estuary of the Severn; length 130 mi.; connected by canal with the Severn at Gloucester.
**Wy'nantskill,** stream in s.e. New York, about 20 mi. long, flowing into Hudson R. at Troy, **3545.**
**Wyoming** (*wī-ō'mĭng*), a Rocky Mt. state of the U.S.; 98,000 sq. mi.; pop. 194,402; cap. Cheyenne; **3818–22,** *maps.* **3820, 3584–5;** chief cities, **3820, 3822;** fossils, **1683, 1336;** history, **3822;** origin of name, **3347;** prehistoric animals, **132,** *picture,* **135;** Shoshone dam, **3820, 954;** Sioux raids, **1773;** state flower, **3347;** surface features, **3818;** woman suffrage, **3778;** Yellowstone National Park, **3818, 3829–30.**
**'Wyoming',** U.S. battleship, *picture,* **2657.**
**Wyoming, University of,** at Laramie, Wyo.; co-ed. state institution; founded 1886; liberal arts, agriculture, education, and engineering, *picture,* **3821.**
**Wyoming Valley,** fertile valley of Luzerne County, Pa., along n. branch of Susquehanna R.; defeat of Americans by Tories and Indians July 3, 1778, followed by massacre of inhabitants; **869, 2722.**
**Wyss** (*vĭs*), **Johann Rudolf** (1781–1830). Swiss author ('The Swiss Family Robinson').
**Wythe, George** (1726–1806). Amer. jurist, b. near Hampton, Va.; as member of Va. House of Burgesses drew up remonstrance to proposed Stamp Act (1764); signer Declaration of Independence, member Constitutional Convention, and active in securing ratification of Federal Constitution in Va.
**Wytheville,** Va., town 130 mi. s.w. of Lynchburg; pop. 2947; textiles, flour, lumber mfrs., and foundry products; fish hatchery, *picture,* **1281.**

# X

OUR letter X got into the alphabet by starting as a chair back. That is what the sign 𓊃 represented in the picture writing of the Egyptians. In the hieratic writing it became 𓏲 and the Phoenicians added some more horizontal bars and made it 𐤎 (*Samekh*), out of which grew the Greek Ξ The Greeks also developed another form Χ which passed to the Romans and from them to us. Just how this form grew out of 𐤎 is not quite clear, but it is thought that *Samekh* was sometimes written ⊞ and that from this two characters developed: one Ξ by removing the vertical lines, and the other ✝ by removing the enclosing square. Then the latter was tilted over and became X. In classic Greek the character Χ came to be used for the letter *Chi* (sounded *kh*), while the Ξ was used for the *ks* sound. In English we pronounce X *ks*, as in *extra,* when the accent precedes, and *gz,* as in *exact,* when the accent follows. At the beginning of a word, as in *Xanthus,* it is pronounced like *z.*

**Xanadu.** In Coleridge's 'Kubla Khan', an imaginary city, residence of the Khan Kubla; description based on that of Khan Kubla's palace in Purchas' 'Pilgrimage'.
**Xan'thium.** A small genus of plants of the family *Ambrosiaceae,* having coarsely toothed leaves and fruit a spiny bur; known as cockle-bur or clot-bur.
**Xantippe** or **Xanthippe** (*zăn-tĭp'ē*), Socrates' shrewish wife, **3270.**
**Xavier** (*zăv'i-ẽr*), **Saint Francis** (1506–52), Span. Jesuit missionary, **3823;** associate of Loyola, **2075.**
**Xenon** (*zĕn'ŏn*), a gaseous element, **50, 4042.**
**Xenophon** (*zĕn'ō-fŏn*) (about 430–355 B.C.), Gk. historian and general, **3823;** and Socrates, **3270.**
**Xerez de la Frontera.** Same as **Jerez de la Frontera.**
**Xerophytes** (*zē'rō-phīts*). Plants adapted to endure scantiness or absence of moisture. *See also in Index* **Hydrophytes; Mesophytes.**
**Xerxes** (*zẽrks'ēz*) **I** (519?–465 B.C.), king of Persia; expedition against Greece, **2739–40;** identified with Ahasuerus, **1181.**
**Ximenes** (*zĭ-mē'nēz*) **de Cisneros, Francisco** (1436–1517). Span. cardinal and statesman, **3823–4, 391.**
**Xingu River,** a large s. tributary of the Amazon, in Brazil; about 1200 mi. long; *map,* **494.**
**Xiphosura** (*zĭf-ō-sū'rȧ*), the king crab or horseshoe crab order, **3945.**
**Xochimilco** (*hō-chō-mĭl'kō*), **Lake,** near Mexico City, **2218.**
**X-rays, 3824–6, 3312;** resemble gamma rays of radium, **2960.**
**Xylem** (*zī'lĕm*), woody fiber of trees, *picture,* **3531.**
**Xylography** (*zī-lŏg'rȧ-fĭ*), block printing, **456.**
**Xylol** (*zī'lōl*), a coal-tar product, **814.**
**Xylonite** (*zī'lō-nīt*), a variety of celluloid, **673.**
**Xylophone** (*zī'lō-fōn*), musical instrument, **2383.**
**'X Y Z' Affair,** in U.S. history, **3826, 14, 2155.**

# Y

THE twenty-fifth letter of the alphabet is one of the four letters (U, V, W, Y) which have developed out of the Greek *Upsilon* Υ And these are all related to the letter F, being derived from the Egyptian hieroglyphic picture of the horned asp  The two horns and the body of the asp appear even better in Y than in the letter F. (Read the story of F.) In the Middle English period Y was a favorite with penmen on account of its final flourish, and they frequently used it in place of a final I. That is why today we write "eity," "fairy," and "kindly," but where Y is not terminal use I, as in "eities," "fairies," "kindliest." In old English books Y often represents the *th* sound, as in "ye" for "the," beeause of its resemblance in form to the Anglo-Saxon character Þ which had the sound of *th*. The printers did not have this charaeter and so replaced it sometimes by *th* and sometimes by *y*.

**Yablonoi Mts.** A system of s. Siberia, extending from s.w. to n.e. 1000 mi. in the direction of the Stanovoi range; highest point about 8000 ft.

**Yachting** (*yąt'ing*), **444–5.**

**Yad'kin River,** N.C., rises in Blue Ridgc Mts. and flows 300 mi. to South Carolina border; thence called Pedee; *map,* **2518;** Boone's home on, **464.**

**Yahoos** (*yä'hųz*), in 'Gulliver's Travels', **3409.**

**Yahveh** (*yä'vā*). *See in Indcx* **Jehovah.**

**Yak,** a bovine animal of the Himalayas, **3827,** *picture,* **231;** altitude range, *picture,* **397;** grinding grain, *picturc,* **3496.**

**Yak'ima, Wash.** Industrial city and fruit and farming trade center in s.-center; pop. 18,539; fruit cannery, lumber mill, sugar refinery; ships great quantities of apples.

**Yakima Indians.** Tribe formerly living in e. Washington along Columbia and Yakima rivers; originally were salmon fishers, root diggers, and traders between tribes e. of Rockies and those w. of Cascades.

**Yakima Valley,** Wash., *picture,* **3688.**

**Yakutsk** (*yä-kųtsk'*), immense region in e. Siberia; 1,533,000 sq. mi.; cap., Yakutsk; climate, **795.**

**Yale** (*yāl*), **Elihu** (1648–1721). Eng. philanthropist, b. Boston, Mass.; founder of Yale College.

**Yale lock, 2042–3.**

**Yale University,** at New Haven, Conn.; 3d oldest univ. in U.S.; men, non-sect.; chartered 1701 as Collegiate School of Connecticut, name changed 1718 in honor of Elihu Yale; arts and science, medicine, divinity, law, fine arts, music, forestry; Sheffield Scientific School; Peabody Museum of Natural History; graduate school; **2456, 830, 833,** *picture,* **868;** athletic "bowl," **829,** *picture,* **830.**

**Yalu'.** A river 300 mi. long forming part of the boundary between Manchuria and Korea; it flows s.w. into the Bay of Korea; in the naval battle of the Yalu (1894), fought at its mouth, the Japanese destroyed the Chinese fleet; its crossing by the Japanese (May, 1904) was marked by the first great battle of the Russo-Japanese War.

**Yam,** a vegetable resembling the sweet potato, **3406.**

**Yanaon** (*yą-ną-ôn'*), Fr. possession in India; 9 sq. mi.; **1756.**

**Yancey** (*yăn'si*), **William Lowndes** (1815–63). Amer. orator and political leader, b. Warren County, Ga.; strong states'-rights man and leader of radical secession from Democratic party which insured Lincoln's election.

**Yangtze** (*yäng'tsĕ*) **River,** longest and most important waterway in China; rises in Tibet, flows 3000 mi. to China Sea; **3827, 230, 740;** at Hankow, **1575.**

**Yan'kee, 3828.**

**"Yankee clippers," 3208.**

**'Yankee Doodle', 3828, 2405.**

**Yankton,** S.D. City on Missouri R. 60 mi. s.w. of Sioux City; pop. 5204; flour, bricks; until 1883 cap. of Territory of Dakota; Yankton College.

**Yankton College.** At Yankton, S.D.; co-ed.; founded 1881 by Congregationalists; liberal arts.

**Yap** (*yäp*), one of Caroline Isls., formerly German, important cable station; mandate dispute, **3812, 1582.**

**Yapura** (*yä-pų-rä'*) **River,** one of chief tributaries of Amazon, rising in Columbian Andes; 1800 mi.; *map,* **835.**

**Yaqui** (*yä'kē*) **Indians.** Mex. tribe living in Sonora; engaged in agriculture, weaving; highly developed clan system; much reduced in numbers by wars arising from rebellions against Mex. govt.

**Yard,** a unit of measure, **3715, 3714.**

**Yard,** of ship, **3209.**

**Yards, freight, 2970–1.**

**Yareta,** a woody fungus of S. Amer., **449.**

**Yarkand** (*yär-kănd'*), trade town in Chinese Turkestan (Sinkiang), in rich oasis of Yarkand and on Yarkand R., 100 mi. s.e. of Kašhgar; pop. 50,000; felt, carpets; **3555, 228.**

**Yarmouth** (*yär'mŭth*), Nova Scotia. Seaport at s.w. extremity; pop. 7500; exports lumber and fish; shipyards and various mfrs.; summer resort.

**Yarmouth, Great.** Seaport and watering place on e. coast of England, 121 mi. n.e. of London; pop. 56,000; herring fisheries (Yarmouth bloaters).

**Yarn,** cotton, **904;** wool, **3787.**

**Yaroslaf** (*yä-rō-slăf'*), Russia. Port on Volga R., 160 mi. n.e. of Moscow; pop. 120,000; textiles; 13th cent. cathedral.

**Yat'aghan,** a curved sword, **3422.**

**Yaupon** (*yą'pŏn*), a kind of tea, **3451.**

**Yawl,** sailing vessel, **3209.**

**Yaz'oo River,** Miss., formed by union of Tallahatchie and Yalobusha rivers; 300 mi. to the Mississippi; **2261–2.**

**Year,** in calendar, **573–5;** beginning dates, **2478–9;** length on other planets, **2816, 2818.** *See also in Index* each month by name.

**Yeast,** a microscopic plant, **3828–9;** in bread-making, **496;** causes fermentation, **1232, 2825;** malt used in manufacture, **2131;** secretes zymase, **1173.**

**Yeats** (*yāts*), **Jack Butler** (born 1871). Irish painter and illustrator, brother of William; wrote 'Life in the West of Ireland', illustrated books by Synge and other Irish writers.

**Yeats, William Butler** (born 1865), Irish poet and dramatist; connected with Celtic revival and Irish Theater movement ('The Land of Heart's Desire'; 'Deirdre'; 'The Wild Swans of Coole'; 'J. M. Synge and the Ireland of His Time'); **1814, 1038.**

**Yed'o,** Japan, former name of Tokyo, **3511.**

**Yekaterinburg** (*yā-kä'tā-rēn-bųrĸ*). Same as **Ekaterinburg.**

**Yekaterinodar** (*yā-kä-tā-rē-nō-där'*). Same as **Ekaterinodar.**

**Yekaterinoslav** (*yā-kä-tā-rē-nō-slăf'*). Same as **Ekaterinoslaf.**

**Yellow-bellied sapsucker, 3781,** *picture,* **416.**

**Yellow cedar,** a Pacific coast cypress, **946.**

**Yellow daisy, 953.**

**Yellow fever,** a disease transmitted by mosquitoes, **2334–8, 3144–5, 1450;** banished from Panama, **2651–4;** Gorgas' work, **1490;** stamped out in New Orleans, **2471.**

**Yellow-hammer,** bird, *picture,* **416.**

**Yellow-headed blackbird, 432, 433.**

**Yellow-jacket,** a social wasp, **3690, 3693, 1681,** *picture,* **359.**

**Yellowlegs.** The name of two snipes found in both N. and S. Amer. and migrating as far s. as Patagonia. The greater yellowlegs (*Totanus melanoleucus*) is 15 in. long, blackish-brown above, and white below with breast and neck spotted with brown; the pale yellow legs are very long and slender, as is also the bill; being easily attracted to decoys, it is a favorite with hunters. The common yellowlegs (*Totanus flavipes*) is like the other except in size (length 11 in.).

**Yellow locust,** a tree, **2045.**

**'Yellow Peril',** painting by William II of Germany, **3738.**

**Yellow pine, 2808, 2809;** annual cut in U.S., **3590.**

**Yellow plum, wild, 3251.**

**Yellow pond-lily, 3699.**

**Yellow race.** Same as **Mongolian.**

**Yellow River.** Same as **Hwang River.**

**Yellow Sea** or **Hwang-hai,** n. portion of China Sea between Korea, Manchuria, and China; length, about 620 mi.; greatest breadth, 400 mi.; silt deposits, **3827, 749, 1706,** *map,* **740.**

**Yellowstone National Park,** largest and most celebrated national park in U.S., **3829–30, 2399,** *map,* **3820;** buffalo, **431;** geysers, **1454–6,** *pic-*

*turcs*, **2401, 3819**; Timberland Reserve, **1331**; wapiti herds, **3669.**
**Yellowstone River,** tributary of Missouri; rises in n.w. Wyoming, flows n. and n.e. 1000 mi.; **3830,** *map*, **2309.**
**Yellow-stripe rust, 3099.**
**Yellow warbler, 3669**; lined nest, **406.**
**Yellow water-lily, 3699,** *pictures*, **474.**
**Yemen** (*yĕm'ĕn*), dist. of s.w. Arabia on Red Sea; 75,000 sq. mi.; pop. 1,000,000; mountainous country with low plains on coast; coffee, live stock; cap. Sana (pop. 25,000); Turkish vilayet before World War; **167,** *map*, **232–3.**
**Yen.** The unit of the Japanese monetary system, worth $.498; formerly coined in gold and silver, now coined only in gold in 5, 10, and 20 yen pieces.
**Yenisei** (*yĕn-ĭ-sā'ē*), one of great rivers of Siberia; rises in n.w. Mongolia, flows n. 3000 mi. to Bay of Yenisei, an inlet of Arctic Ocean; crossed by Trans-Siberian R.R. at Krasnoyarsk; **230, 3228.**
**Yerba maté.** *See in Index* **Maté.**
**Yerkes** (*yĕr'kēz*), **Charles Tyson** (1837–1905). Amer. capitalist and munificent patron of science and art; obtained control of and exploited Chicago city railways by methods which were severely criticized; gave great Yerkes telescope to U. of Chicago.
**Yerkes Observatory, 2552,** *picture*, **2551**; telescope, **3463.**
**Yermak** (*yĕr'măk*) (d. 1584), Cossack outlaw, initiator of Rus. conquest of Siberia; made prince of Siberia by Ivan the Terrible; **3228.**
**Yew,** a shrubby conifer, **3830,** *picture*, **2853.**
**Yezd** (*yĕzd*), Persia, city 165 mi. s.e. of Ispahan; pop. 45,000; on important trade route; cobalt, antimony, and nickel in vicinity; **2734, 228.**
**Yez'o.** Same as **Hokushu.**
**Ygdrasil** (*ĭg'drà-sĭl*), in Norse myth., tree of life, **2560, 3534.**
**Yid'dish,** Jewish dialect, **1625.**
**Ylang-ylang** (*ē'läng-ē'läng*), a perfume, **2728.**
**Yo,** r. in Africa, **34.**
**Yokohama** (*yō-kō-hä'mä*), chief seaport of Japan, 17 mi. s. of Tokyo; pop. 425,000; **3830–1, 1864.**
**Yolk,** of egg, **1090**; in wool, **3787.**
**Yom Kip'pur.** Jewish day of atonement, in the fall.
**Yonge** (*yŏng*), **Charlotte Mary** (1823–1901). Eng. novelist and writer on religious and educational subjects ('The Dove in the Eagle's Nest'; 'Cameos of English History').
**Yon'kers,** N.Y. Mfg. and residential city on Hudson R. adjoining New York City on n.; pop. 100,176; carpets, rugs, hats, elevators, sugar, electrical supplies, clothing; land and water trade; settled 1650.
**Yonne** (*yŏn*), r. in s. France, **3173.**
**York, House of,** royal line in England, founded by Richard, duke of York; Edward IV, **1088**; list of rulers, **1152**; Richard III, **3016**; in Wars of the Roses, **3066, 3068, 1634, 1635.**
**York, Richard, Duke of** (1411–60), Eng. prince; protector of England during illness of Henry VI; claimant for throne; **3066, 3068.**
**York,** England, industrial center, cap. of Yorkshire, near center on Ouse R.; pop. 78,000; important Rom. settlement; cathedral, **1160.**
**York,** Neb. City about 50 mi. w. of Lincoln; pop. 5388; York College; agricultural and stock-raising interests.
**York,** Ontario, former name for Toronto, **3517.**
**York,** Pa., industrial and trade center in farming dist. 22 mi. s. of Harrisburg; pop. 47,512; cement, dental supplies, iron and steel products, roofing, wall paper, glass, pottery, tobacco; **2721.**
**York College.** At York, Neb.; co-ed.; founded 1890 by United Brethren in Christ; arts and science, normal dept., music, art.
**York Cycle,** of mystery plays, **1033.**
**York River,** in Virginia, flowing into Chesapeake Bay, **3648.**
**Yorkshire,** largest county in England; in n.e. on North Sea; divided into 3 Ridings (E., N., and W.); 6066 sq. mi.; pop. 4,000,000; farming, mfg., coal mining; Leeds, **1985**; Sheffield, **3200.**
**Yorkshire swine,** *picture*, **49.**
**Yorkshire terrier,** *picture*, **1022.**
**Yorktown,** Va., historic town on Chesapeake Bay, 60 mi. s.e. of Richmond, **3831**; Cornwallis' surrender, **3004**; Rochambeau at, **3033.**
**Yosemite** (*yō-sĕm'ĭ-tē*) **Falls,** Calif., **3831,** *picture*, **2403.**
**Yosemite National Park, 2399,** *maps*, **2400, 577, 578,** *picture*, **586**; and John Muir, **2365**; redwood trees, **3176.**
**Yosemite Valley,** in cent. Calif., part of Yosemite National Park, **3831–2, 3231.**
**Yoshihito** (*yō-shē-hē'tō*) (born 1879). Emperor of Japan since 1912.
**Yoshinobu** (*yō-shē-nō'bų*) (Keiki), **Prince of Tokuwaga** (1837–1902). Japanese statesman and last of the shoguns; resigned office to emperor in 1867 and supported him in ensuing struggle between imperial and shogunate parties.
**Youghal** (*yų'ąl*). Seaport and watering place of Ireland on the Blackwater R. 27 mi. e. of Cork; fisheries; has house of Sir Walter Raleigh.
**Young, Arthur** (1741–1820), influential Eng. writer on agriculture and social economy; quoted, **3023.**
**Young, Brigham** (1801–77), successor to Joseph Smith as head of Mormon church; b. Whitingham, Vt.; **2327, 3610**; founds Salt Lake City, **3116.**
**Young, Edward** (1683–1765). Eng. poet, whose fame rests on 'Night Thoughts on Life, Death, and Immortality'; this contains passages of fine imagination and many phrases which have passed into proverbial speech ("Procrastination is the thief of time"), but is marred by its gloomy tone.
**Young, Ella Flagg** (1845–1918), Amer. educator, superintendent of schools of Chicago, 1909–15; first woman pres. of the National Education Association; **3779.**
**Young, Thomas** (1773–1829). Eng. physicist and archeologist; discovered interference of light.
**Younghusband, Sir Francis Edward** (born 1863), Eng. soldier and political agent in India; commissioner to Tibet 1902–04; **3496.**
**Young Men's Christian Association, 3832.**
**Young Pretender, 2914.**
**Youngstown,** Ohio, 2d largest steel center in U.S.; pop. 132,358; **3832–3.**
**"Young Turks," 3560**; policy in Balkans, **310.**
**Young Women's Christian Association, 3833.**
**Ypres** (*ē'pr'*), Belgium, town 35 mi. s. of Ostend, pop. 17,000; **3833–4**; Flemish trade center, **373**; in World War, **3792, 3810, 941.**
**Ysaye** (*ē-zä'yĕ*), **Eugène** (born 1858). Belgian violinist, conductor Cincinnati Symphony Orchestra since 1918.
**Yser** (*ē-zêr'*) **River,** Fr. and Belgian r. rising 20 mi. s.e. of Calais and flowing e. and n. to sea at Nieuport, **373**; in World War, **3810.**
**Ysleta** (*ēs-lā'tä*), Tex. Same as **Isleta.**
**Ytterbium** (*ĭ-tēr'bĭ-ŭm*), a rare chemical element, **4042.**
**Yt'trium,** a rare chemical element, **4042.**
**Yturbide, Augustin de.** Same as **Iturbide.**
**Yuan Shi-Kai** (*yų-än' shē-kī'*) (1859–1916). Chinese soldier and statesman, pres. of republic of China from 1913 until his death.
**Yucatan** (*yų-kà-tăn'*), peninsula between Gulf of Mexico and Caribbean Sea, **3834–5, 1548,** *maps*, **2514–5**; Maya ruin, *picture*, **289**; sisal plant, **3244, 1630.**
**Yucatan,** Mexico. State in n. of Yucatan peninsula, on Gulf of Mexico; 15,939 sq. mi.; pop. 348,000; cap. Merida.
**Yucatan Channel** or **Straits,** between Gulf of Mexico and Caribbean Sea, **644, 1548.**
**Yucca** (*yŭk'à*), a plant, **3835, 3533, 205.**
**Yuen** (*yų-ĕn'*) **dynasty,** in China (1260–1368), **2285.**
**Yugo-Slavia.** Same as **Jugo-Slavia.**
**Yukon** (*yų'kŏn*), a large river of N. America, **3835–6, 604, 3582, 76,** *maps*, **75.**
**Yukon Territory,** Canada, most northwesterly political division of Canada; 207,076 sq. mi.; pop. 8500; gold fields, **3836, 603,** *map*, **602–3**; gold fields, **1933, 76.**
**Yule.** The Scandinavian and early Saxon name for Christmas. *See in Index* **Christmas.**
**Yu'ma,** Ariz., city in s.w. on Colorado R. at mouth of Gila; pop. 4237; climate, **200**; irrigation project, **202, 1829.**
**Yuma** ("sons of the river"), chief tribe of Yuman stock of N. Amer. Indians; lived originally about confluence of Gila and Colorado rivers; **1767.**
**Yu'man,** a linguistic stock of N. Amer. Indians, living in Calif., Ariz., and n. Mexico; agricultural rather than hunting people; chief tribes grouped among "pueblo" Indians, **1767.**
**Yungas,** Bolivian valleys, **449.**
**Yunnan** (*yųn-năn'*). Southwest province of China; 146,000 sq. mi.; pop. 9,000,000; rich copper mines; exports tin; cap. Yunnanfu.
**Yuriev** (*yųr'yĕf*). Same as **Dorpat.**
**Yuste** (*yųs'tā*), Spain, monastery in w. center near Plasencia; Charles V, **690.**
**Yusuf ibn Ayyub** (*yų'sųf ĭbn ī'yųb*), original name of Saladin, **3112.**

# Z

OUR Z  comes from the Greek Ζ (*Zeta*). Originally in Egyptian picture writing it  represented a duck  Written in a running hand (the "hieratic" form), it became the symbol  and then in the Phoenician and early Greek alphabets came to look more like the letter I crushed down  Ⅱ Ⅰ. As the letter became more crushed the vertical became diagonal and finally slipped at top and bottom so as to join the horizontals as in the Z today. Among the Phoenicians it was the 7th letter and so remained in the Greek and early Latin alphabets, but it was dropped from the Latin in the third century B.C. Later when the study of Greek became a mark of culture among the Romans, it was restored, but it had lost its place in the alphabet and had to fall in at the tail of the procession, where it still remains.

**Zacatecas** (*sä-kä-tä'käs*), state in cent. Mexico; 24,471 sq. mi.; pop. 487,000; silver, **2210.**

**Zacatecas,** Mexico. Cap. of state of Zacatecas, 350 mi. n.w. of Mexico City; pop. 26,000.

**Zagreb** (*zä'grĕb*). Same as **Agram.**

**Za'ma,** battle of (202 B.C.), **1575, 3046.**

**Zambezi** (*zăm-bē'zĭ*) **River,** 4th largest r. of Africa, **3837,** *maps,* **3282, 1069;** Victoria Falls, **3640.**

**Zamenhof** (*zä'mĕn-hōf*), **Lazarus Ludwig** (1859–1917), Rus. philologist, inventor of Esperanto, **1177.**

**Zancle** (*zăn'klē*), anc. name of Messina, **3230.**

**Zanesville** (*zānz'vĭl*), Ohio, city 52 mi. e. of Columbus at junction of Muskingum and Licking rivers; pop. 29,569; pottery, **2570.**

**Zang'will, Israel** (born 1864). Brit. (Jewish) novelist and dramatist, leader in Zionist movement ('Children of the Ghetto'; 'The Melting Pot').

**Zan'zibar,** isl. off e. coast of Africa; 640 sq. mi.; pop. 115,000; **3837–8,** *map,* **1069.**

**Zanzibar,** cap. of Zanzibar Protectorate; pop. 35,000; **3837–8,** *picture,* **39.**

**Zanzibar Protectorate** (Zanzibar and Pemba), **3838.**

**Zara** (*zä'rà*). Adriatic port on Dalmatian coast, 90 mi. s.e. of Fiume; pop. 35,000; assigned to Italy by Treaty of Rapallo (1920).

**Zarago'za.** Same as **Saragossa.**

**Zarathus'tra.** Same as **Zoroaster.**

**Ze'a,** the corn genus, **891.**

**Zealand** (*zē'lànd*), largest of the Danish isls., **996,** *map,* **997;** Copenhagen, **880.**

**Zealand.** Province of s.w. Netherlands; 707 sq. mi.; pop. 246,000; cap. Middelburg.

**Ze'bra, 3838;** evolutionary position among animals, *diagram,* **128.**

**Zebra wolf,** *picture,* **3439.**

**Ze'bu,** the Indian ox, **3838.**

**Zebulon** (*zĕb'yu-lŏn*). Hebrew patriarch, son of Jacob and ancestor of the tribe of Zebulon.

**Zechariah** (*zĕk-à-rī'à*) (6th–5th cents. B.C.). Hebrew minor prophet; returned to Palestine from captivity and promoted rebuilding of the temple ('Book of Zechariah').

**Zeebrugge** (*zā'brụg-ē*), seaport of n. Belgium; Ger. submarine base (1914–18), **520.**

**Zeisler** (*tsīs'lēr*), **Fannie Bloomfield** (born 1866). Amer. concert pianist, b. in Austrian Silesia; one of foremost women musicians.

**Zemstvos** (*zĕmst'fōz*), local councils in Russia, **3091.**

**Zenana** (*zĕ-nä'nà*). In India, the women's apartments.

**Zend-Aves'ta,** sacred book of Zoroastrians, **3842, 2737.**

**Zeng'er, Peter** (1680?–1746), Amer. publisher, b. Germany; libel trial, **2497.**

**Zenobia** (*zĕ-nō'bĭ-à*) (3d cent. B.C.). queen of Palmyra, **2648.**

**Ze'no of Citium** (342?–270? B.C.). Gk. philosopher, founder of the Stoic school of philosophy. *See in Index* **Stoicism.**

**Zeno of Elea** (5th cent. B.C.). Gk. philosopher, inventor of many ingenious paradoxes to discredit common beliefs about time, space, and motion; taught the unity of all being.

**Zephaniah** (*zĕf-à-nī'à*). A Hebrew minor prophet, said to have lived in latter half of 7th cent. B.C.; prophesied punishment of Israel for its sins.

**Zephyrus** (*zĕf'ĭ-rŭs*), in Gk. myth., the west wind, **29.**

**Zeppelin** (*tsĕp'ĕ-lĭn*), **Friedrich, Count von** (1838–1917), Ger. general and airship builder, **313–4.**

**Zeppelin,** a type of dirigible balloon, **313–4,** *pictures,* **315, 318–9, 320.**

**Zerafshan** (*zĕr-äf-shän'*), r. of w. Turkestan; 400 to 500 mi.; **3556.**

**Ze'ro,** its importance in arithmetic, **2542–3.**

**Zero, absolute, 1618.**

**Zeus** (*zūs*), the supreme deity in Gk. myth., corresponding to Jupiter among the Romans, **3838–9, 3607;** in Aesop's fable of the frogs, **30;** and Danaë, **2731;** and Europa, **563;** flood, **1000;** and Io, **1802;** Olympic Games, **2580;** oracle at Dodona, **991;** and Phaethon, **2759;** and Prometheus, **2921;** statue at Olympia, **3178,** *picture,* **3179;** temple at Athens, **249.**

**Zeuxis** (*zūks'ĭs*), Gk. painter, "realist," using light and shadow (then new); legend says, painted grapes at which birds pecked; **1529.**

**Zhukofsky** (*zhụ-kŏf'skē*), **Basil** (1783–1852), Rus. author, **3098.**

**Zic'zac,** the "crocodile bird," *picture,* **922.**

**Zi'don,** Palestine. Same as **Sidon.**

**Zimbalist** (*zĭm'bà-lĭst*), **Efrem** (born 1889). Rus. violinist, made début in St. Petersburg at 17; came to U.S. 1911; married Alma Gluck 1914.

**Zimmermann** (*tsĭm'ĕr-män*), **Alfred** (born 1860), Ger. foreign minister 1916–17, **3747, 2218;** on submarine warfare, **3800.**

**Zinc** (*zĭnk*), a metallic element, **3838-40, 4042;** in alloys, **99, 493, 881, 2506;** in Germany, **1194;** in Missouri, **2270;** oxide used in paint, **2642;** Poland, **2857;** prevents rust, **3099;** refined by electrolysis, **1125;** sulphide detects radioactivity, **2960,** *picture,* **2958;** in U.S., **3590, 2460:** Wales, **3664; Wisconsin, 3771.**

**Zinc etching, 1172.**

**Zinc white, 2642.**

**Zin'nia.** A genus of the *Compositae* containing about 20 species native to Mexico, Cent. Amer., and the s.w. U.S.; they are stiff, erect, and coarse with bright colored but not very dainty single and double flowers; the garden zinnia (*Zinnia elegans*) is the best known species.

**Zion** (*zī'ŏn*). Jebusite stronghold at Jerusalem captured by David; name also applied to all Jerusalem.

**Zi'onism,** Jewish movement for return to Palestine, **1892, 2647.**

**Zion Park.** National monument in s. Utah; 76,800 acres; gorge 800 to 2000 ft. deep with steep walls of gorgeous coloring.

**Zirco'nium,** an earthy metallic element, **4042.**

**Zis'ka, John** (1376?–1424). Bohemian Hussite leader, great general, and almost legendary hero; died at point of apparent triumph over Emperor Sigismund.

**Zith'er,** musical instrument, **2383,** *picture,* **2382.**

**Zodiac** (*zō'dĭ-ăk*), the zone in the skies traversed by the sun and planets, **3840;** mapped by Chaldeans, **298.**

**Zoetrope** (*zō'ē-trōp*), a toy showing motion pictures, **2352.**

**Zola** (*zō'là*), **Emile** (1840–1902), Fr. novelist, **3840, 1365;** defends Dreyfus, **787.**

**Zollern** (*tsôl'ērn*), ancestral home of Hohenzollerns, **1672.**

**Zollverein** (*tsôl'fĕr-īn*) (Ger. *zoll,* "custom," *verein,* "union"), a union of Ger. states for maintenance of uniform rates of duty on foreign imports and of free trade among themselves, instituted in 1819; term is used generally for certain form of customs union; **2929.**

**Zones,** of the earth, **1968–9, 3862.**

**Zones,** geographical, **3862.**

**Zoning,** of cities, **770.**

**Zoölogy** (*zō-ŏl'ō-ġĭ*), **3841, 393–9,** *Study Outline,* **3944–52;** anatomy, **121;** classification of animals, **127, 412;** ecology, **1076;** nature study, **2406–17;** place of man, **2134.** *See in Index* **Animals.**

**Zorn** (*tsôrn*), **Anders Leonhard** (1860–1920). Swedish landscape, figure, and portrait painter; one of the greatest etchers of his time.

**Zorndorf** (*tsôrn'dôrf*). Village of Prussia, 53 mi. n.e. of Berlin; victory of Frederick the Great over the Russians under Fermor (Aug. 25, 1758).

**Zoroas'ter** or **Zarathustra,** Persian teacher, founder of Zoroastrianism, **3841–2.** *See also in Index* **Parsees.**

**Zo'ser,** pharaoh of Egypt, 3d dynasty; step-pyramid of, **1099.**

**Zouaves.** Fr. infantry corps originally recruited in Algeria from the Zouaves, a tribe of Berbers, but now drawn from France; they

wear a picturesque Oriental uniform.

**Zugspitze** (*tsu͞g'spĭts-ē*), highest peak in Germany, **1442.**

**Zuider** or **Zuyder Zee** (*zī'dēr zē*), arm of North Sea extending s. into Netherlands, *map*, **373, 2438;** reclamation project, **1827.**

**Zuloaga** (*thu͞-lō-ä'gä*), **Ignacio** (born 1870), Span. painter, **2633.**

**Zu'luland.** Former Brit. province of Natal, S. Africa; 10,424 sq. mi.; pop. 220,000, chiefly Zulus.

**Zulus** (*zu͞'lu͞z*), Kaffir tribes of Bantu stock, S. Africa, **36, 3280,** *pictures*, **39, 3280, 3283;** superstitions, **2386.**

**Zuñis** (*zu͞'nyēz*), tribe of Pueblo Indians inhabiting w. New Mexico–Arizona region, **2933, 1767, 202.**

**Zurich** (*zu͞'rĭk*), largest city of Switzerland; pop. 207,000; **3842, 3416.**

**Zurich, Lake of,** Swiss lake chiefly in s. part of canton of Zurich; 34 sq. mi.; city of Zurich at n. end; **3414,** *map*, **3415.**

**Zutphen** (*zŭt'fĕn*), Town in s.e. Netherlands, several times taken and sacked; pop. 18,000; Sir Philip Sidney killed (1586).

**Zwickau** (*tsvĭk'ou*), Germany, mfg. town of Saxony, 60 mi. s.w. of Dresden on Mulde R.; pop. 70,000; old churches; coal fields; **1444;** birthplace of Schumann, **3143.**

**Zwinger** (*tsvĭng'ĕr*), **The,** art gallery, Dresden, **1041.**

**Zwingli** (*tsvĭng'lē*), **Ulrich** (1484–1531), Swiss Protestant reformer, **3842, 2987.**

**Zwolle** (*zvŏl'ē*), Netherlands. Cap. of province of Overyssel, 60 mi. n.e. of Amsterdam; pop. 35,000; center of n. and e. canal systems; cotton, iron, ships; cattle and fish market; near by Thomas à Kempis lived and died.

**Zygospore** (*zī'gō-spōr*), a spore resulting from fusion of two cells, **3173.**

**Zymase** (*zī'mās*), a ferment found in yeast, **3828.**




Hilda Hanway

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